**CUSTOMER:**____________ **DATE:** 2019.6.14

# APPROVAL SPECIFICATION

**ROHS**
**COMPLIANT**

PRODUCT NAME: Winding Wire Common Mode Choke Coil

YOUR PART NO.:

OUR PART NO.: MGRC2012

VERSION: V1.0

| | | |
|---|---|---|
| **RECEPTION**<br>**THE SPECIFICATION HAS BEEN ACCEPTED.**<br>**COMPANY：** **DATE：** | | |
| **CFMD** | **CHKD** | **RCVD** |

MANUFACTURING NAME

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| CFMD. | CHKD. | DSGD. |
|---|---|---|
| Remo | Yusheng Wang | Wei Liu |

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## Component SPEC Version Record

| Rev. | Effective Date | Changed Contents | Change Reasons | Approved By |
|---|---|---|---|---|
| 1.0 | 2019.06.14 | New released | / | Remo |
|  |  |  |  |  |

## 1.Scope

This specification applies to the MGRC2012 series of Common Mode Choke Coil.

## 2.Product Identification

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| MGRC | 2012 | M | □□□ | T | - | 2 | - | LF |
| ① | ② | ③ | ④ | ⑤ | | ⑥ | | ⑦ |

① Series name (Wire Wound Chip Common Mode Choke Coil)

② Dimensions L×W:（2012=2.0×1.2 mm）

③ Material code （M For Standard ， L For Larger Current，H for High-speed，U For Ultra High-speed）

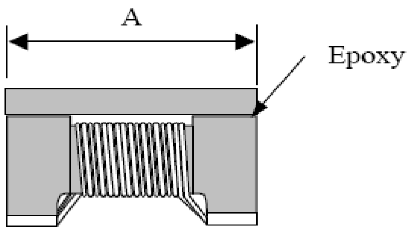
④ Impedance:（Example 900=90×10^0=90Ω，121=12*10^1=120）

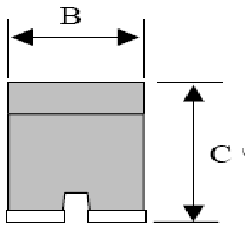
⑤ Packing Style:（T: Taping B: Bulk）

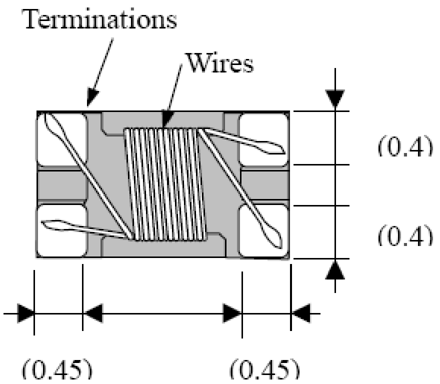
⑥ Number of signal lines

⑦ Lead Free

## 3.Appearance, Dimensions

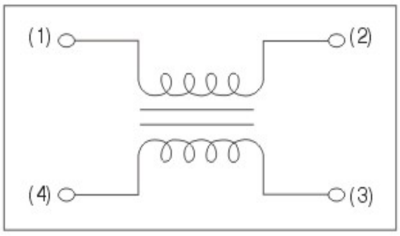






| | |
|---|---|
| A | 2.0±0.2 |
| B | 1.2±0.2 |
| C | 1.2±0.2 |

## 4.Electrical Schematic



## 5.Testing Conditions

<Unless otherwise specified>
Temperature : Ordinary Temperature 5 to 35℃
Humidity : Ordinary Humidity 25 to 85% (RH)

<In case of doubt>
Temperature : 20±2℃
Humidity : 60 to 75% (RH)
Atmospheric Pressure : 86 to 106 kPa

## 6.Rating

**MGRC2012M TYPE**

| Part NO. | Common mode impedance@100MHz | Max. DC Resistance | Max. Rate Current | Rate Voltage | Min. Insulation Resistance |
|---|---|---|---|---|---|
| **Units** | **Ω** | **Ω** | **mA** | **V** | **MΩ** |
| MGRC2012M300T-2-LF | 30±25% | 0.20 | 450 | 50 | 10 |
| MGRC2012M670T-2-LF | 67±25% | 0.25 | 400 | 50 | 10 |
| MGRC2012M900T-2-LF | 90±25% | 0.30 | 370 | 50 | 10 |
| MGRC2012M121T-2-LF | 120±25% | 0.30 | 370 | 50 | 10 |
| MGRC2012M151T-2-LF | 150±25% | 0.30 | 370 | 50 | 10 |
| MGRC2012M181T-2-LF | 180±25% | 0.35 | 330 | 50 | 10 |
| MGRC2012M201T-2-LF | 200±25% | 0.35 | 330 | 50 | 10 |
| MGRC2012M261T-2-LF | 260±25% | 0.40 | 300 | 50 | 10 |
| MGRC2012M371T-2-LF | 370±25% | 0.45 | 280 | 50 | 10 |
| MGRC2012M501T-2-LF | 500±25% | 0.55 | 200 | 50 | 10 |
| MGRC2012M601T-2-LF | 600±25% | 0.55 | 200 | 50 | 10 |
| MGRC2012M801T-2-LF | 801±25% | 0.70 | 180 | 50 | 10 |
| MGRC2012M921T-2-LF | 920±25% | 0.95 | 160 | 50 | 10 |
| MGRC2012M102T-2-LF | 102±25% | 0.80 | 150 | 50 | 10 |

## MGRC2012L TYPE

| Part NO. | Common mode impedance@100MHz | Max. DC Resistance | Max. Rate Current | Rate Voltage | Min. Insulation Resistance |
|---|---|---|---|---|---|
| **Units** | **Ω** | **Ω** | **mA** | **V** | **MΩ** |
| MGRC2012L900T-2-LF | 90±25% | 0.19 | 400 | 50 | 10 |
| MGRC2012L121T-2-LF | 120±25% | 0.22 | 370 | 50 | 10 |

## MGRC2012H TYPE

| Part NO. | Common mode impedance@100MHz | Max. DC Resistance | Max. Rate Current | Rate Voltage | Min. Insulation Resistance |
|---|---|---|---|---|---|
| **Units** | **Ω** | **Ω** | **mA** | **V** | **MΩ** |
| MGRC2012H670T-2-LF | 67±25% | 0.30 | 320 | 20 | 10 |
| MGRC2012H900T-2-LF | 90±25% | 0.40 | 280 | 20 | 10 |
| MGRC2012H121T-2-LF | 120±25% | 0.40 | 280 | 20 | 10 |

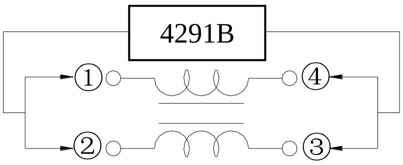
## MGRC2012U TYPE

| Part NO. | Common mode impedance@100MHz | Max. DC Resistance | Max. Rate Current | Rate Voltage | Min. Insulation Resistance |
|---|---|---|---|---|---|
| **Units** | **Ω** | **Ω** | **mA** | **V** | **MΩ** |
| MGRC2012U900T-2-LF | 90±25% | 0.40 | 280 | 20 | 10 |

## 7.Test Equipment

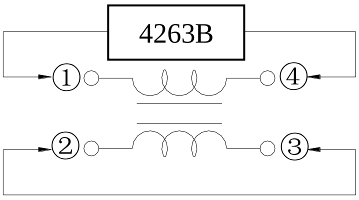
⑴ Common mode impedance

Measured by using 4291B RF impedance/material analyzer



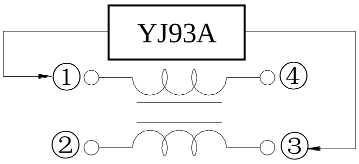
⑵ DC resistance

Measured by using 4263B LCR meter

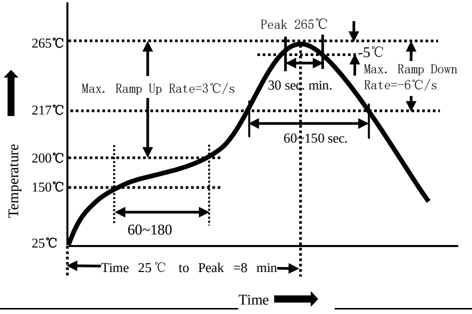
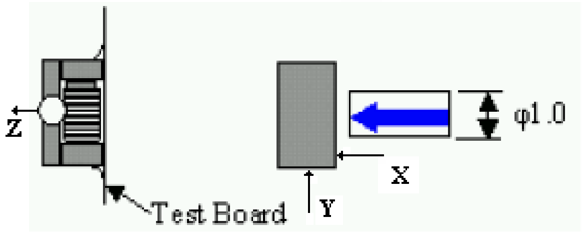
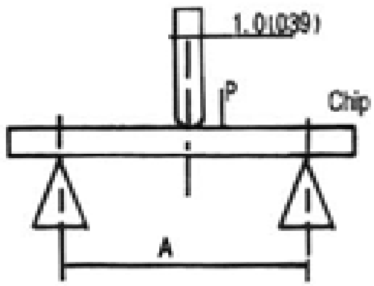


⑶ Insulation resistance

Measured by using YJ93A Standard DC voltage source.



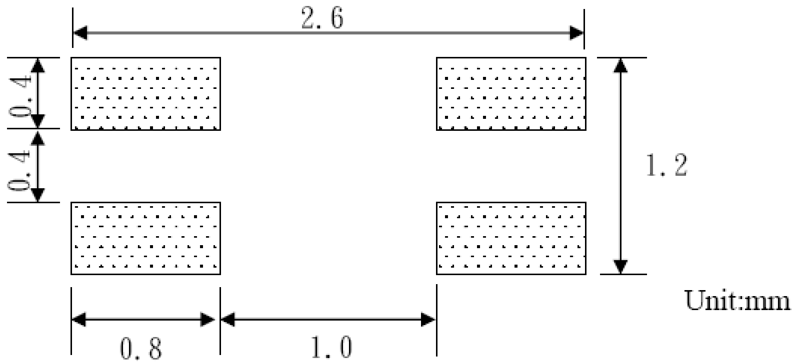
## 8.Reliable Performance

| NO. | Item | Specifications | Test Methods |
|---|---|---|---|
| 1 | Solder-Ability | Terminal area shall be at least 95% covered . | Solder: 96.5% Sn +3.0%Ag+0.5%Cu<br>Temperature: 245℃±5℃<br>Flux: rosin<br>Duration: 3.5±0.5s |
| 2 | Resistance to Soldering Heat | 1）No case deformation or change in appearance.<br>2）｜ΔZ/Z0｜≤20% | ①The peak temperature: 260+5/-0℃.<br>②Reflow:2 times.<br>③Temperature curve is as below:<br> |
| 3 | Terminal Strength | The terminal and body should be no damage | Solder a chip to test substrate, and then laterally apply a load 5N in the X, Y and Z directions<br> |
| 4 | Bending Strength | No mechanical damage should be noticed | Soldering a chip to a test subatrate,<br>bend the substrate by 2mm and then return<br> |

| NO. | Item | Specifications | Test Methods |
|---|---|---|---|
| 5 | Vibration | 1）No mechanical damage shall be noticed<br>2）｜ΔZ/Z0｜≤20% | Frequency: 10 to 55Hz<br>Amplitude: 1.5mm<br>Direction and time :X, Y and Z directions for 2 hours each. |
| 6 | Humidity resistance | | a. Test condition<br>Temp.:85±2℃<br>Humidity: 90%~95%<br>Test time: 1000±24 h<br>b. Measurement method:<br>The component should be stabilized at normal condition for (24±2) hours before test. |
| 7 | High temperature resistance | | a. Test condition<br>Applied rated current.<br>Temp.: 85±2℃<br>Test time: 1000±24 h<br>b. Measurement method:<br>The component should be stabilized at normal condition for (24±2) hours before test. |
| 8 | Low temperature resistance | | a. Test condition<br>Temp.: -40±2℃<br>Test time: 1000±24 h<br>b. Measurement method:<br>The component should be stabilized at normal condition for (24±2) hours before test. |
| 9 | Thermal shock (Temperature cycle) | | a. Test condition<br>1) Temp.: -40℃, time: 30±3min<br>2) Temp.: +85℃, time: 30±3min<br>5 cycles<br>b. Measurement method:<br>The component should be stabilized at normal condition for (24±2) hours before test. |

## 9. Recommended Soldering Conditions

(1) Recommended Footprint

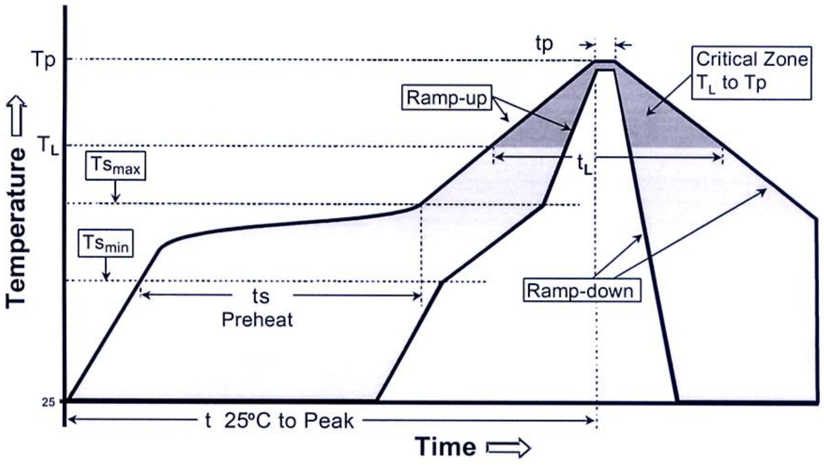


(2) Recommended Reflow soldering conditions

| Profile Feature | Lead-Free Assembly |
|---|---|
| Average Ramp-Up Rate<br>( Tsmax to Tp ) | 3℃ /second max. |
| Preheat<br>– Temperature Min (Tsmin)<br>– Temperature Max (Tsmax)<br>– Time ( tsmin to tsmax)<br>min to tsmax) | 150 ℃<br>200 ℃<br>60-180 seconds |
| Time maintained above:<br>– Temperature (TL)<br>– Time (tL) | 217 ℃<br>60-150 seconds |
| Peak/Classification Temperature (Tp)<br>Peak/Classification Time (Tp) | 255 ℃<br>30 seconds max. |
| Time within 5 °C of actual Peak Temperature (tp) | 20-40 seconds |
| Ramp-Down Rate | 6 ℃/second max. |
| Time 25 °C to Peak Temperature | 8 minutes max. |

Note 1: All temperatures refer to topside of the package, measured on the package body surface.

Standard soldering profile



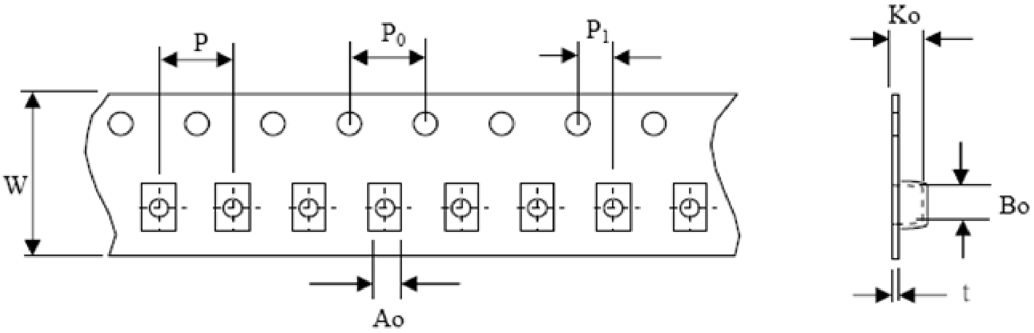
(3) Reworking with soldering iron

The following conditions must be strictly followed when using a soldering iron.

| | |
|---|---|
| **Pre-heating** | 150℃, 1 minute |
| **Tip temperature** | 350℃ max |
| **Soldering iron output** | 30w max |
| **End of soldering iron** | φ1mm max |
| **Soldering time** | 5 seconds max |

## 10.Packaging

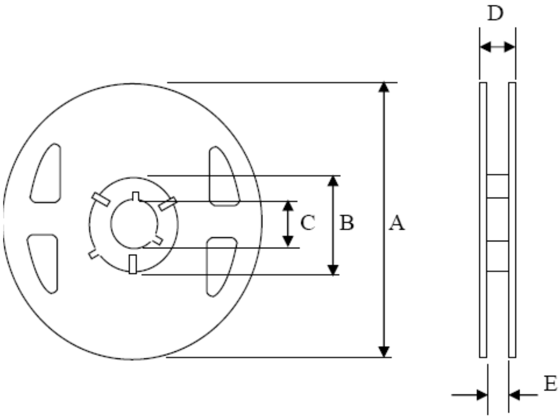
(1) Dimensions of Tape:



(Dimensions in mm; Tolerance : ±0.1)

| Symbol | W | P | $P_0$ | $P_1$ | $A_0$ | $B_0$ | $K_0$ | t |
|---|---|---|---|---|---|---|---|---|
| Dimension | 8.0 | 4.0 | 4.0 | 2.0 | 1.5 | 2.25 | 1.45 | 0.24 |

(2) Dimensions of Reel



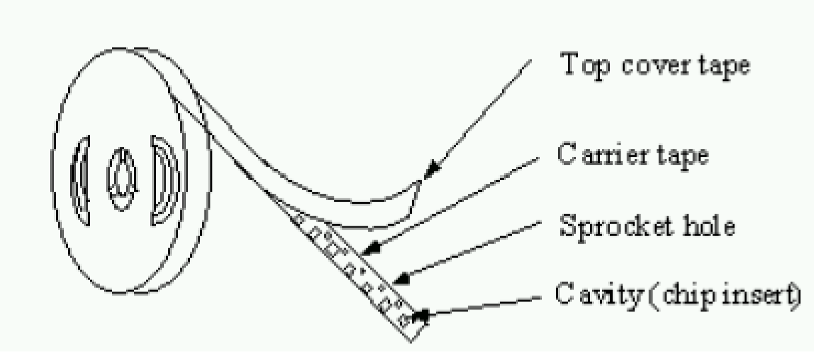
Unit: mm

| | |
|---|---|
| A | 180 |
| B | 60 |
| C | 13 |
| D | 14.4 |
| E | 8.4 |

(3) Pulling strength of tapes:

| | |
|---|---|
| Carrier tape | 10N or more (1kgf or more) |
| Cover tape | 5N or more (1kgf or more) |

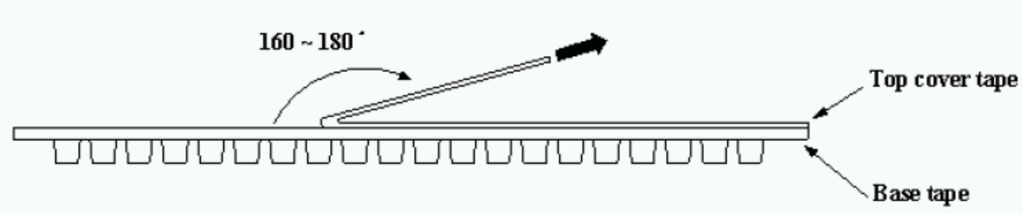
(4) Taping figure and drawing direction:



Tape material:  Base tape: Polystyrene  Cover tape: polyester

（5）Peeling strength of cover tape:

| | |
|---|---|
| Cover tape | 0.10~1.0N |



Test condition:

Temperature: 5~35°C  Humidity: 45~85%

（6）Packing quantity

Φ180 mm reel T type: 2000pcs/reel