



Laird Technologies ,Co., Ltd.

SPECIFICATION FOR APPROVAL

Customer : All

Manufacturer : Laird Technologies Co.,Ltd.

Product : Molding Power Inductor

*Laird P/N : **MGV0503 Series***

Customer P/N : N/A

Issued Date : 2018.2.8

*Rev : **A***

Customer Response

| <i>Approved By:</i> | <i>Signature:</i> | <i>Date:</i> |
|---------------------|-------------------|--------------|
| | | |

Laird Signature

| <i>Approved By</i> | <i>Checked By</i> | <i>Prepared By</i> |
|--------------------|-------------------|--------------------|
| <i>Chiang</i> | <i>Siemens Mi</i> | <i>Denny Chen</i> |

Laird (Foshan) Magnetics Co., Ltd.

Fu'an Industrial Zone, Leliu Town, Shunde, Foshan City, Guangdong, China 528322

Tel: +86 (757) 25638860 Fax: +86 (757) 25638862

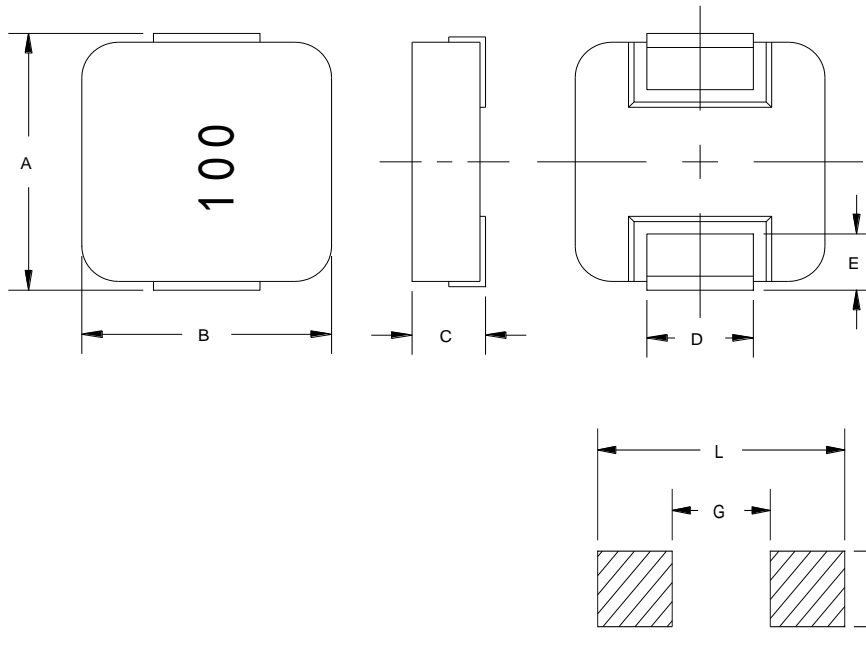
ISO 9001
ISO14001
OHSAS18001

Email: china@lairdtech.com Website: www.lairdtech.com



SPECIFICATION FOR APPROVAL

1.MECHANICAL & DIMENSIONS



| (UNIT: mm) | |
|------------|-----------|
| A | 5.50±0.50 |
| B | 5.10±0.30 |
| C | 3.00±0.40 |
| D | 1.50±0.30 |
| E | 1.10±0.30 |
| L | 6.50 ref |
| G | 2.50 ref |
| H | 1.80 ref |
| REMARK | |
| | |
| | |
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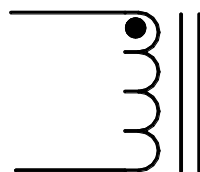
2.PART NUMBER NOMENCLATOR:

MGV 0503 100 M - 1X
A B C D E

A: Product Series.
 B: Series number, part size
 C: Inductance code

D: Inductance Tolerance. (M=±20% ,N=±30%)
 E: "X"=0:Standard catalog part number
 "X"=1-9:Controlled customized part **OR** different performance than std catalog part. And "5-9" is for automotive grade.

3.EQUIVALENT CIRCUIT:



**SPECIFICATION FOR APPROVAL**

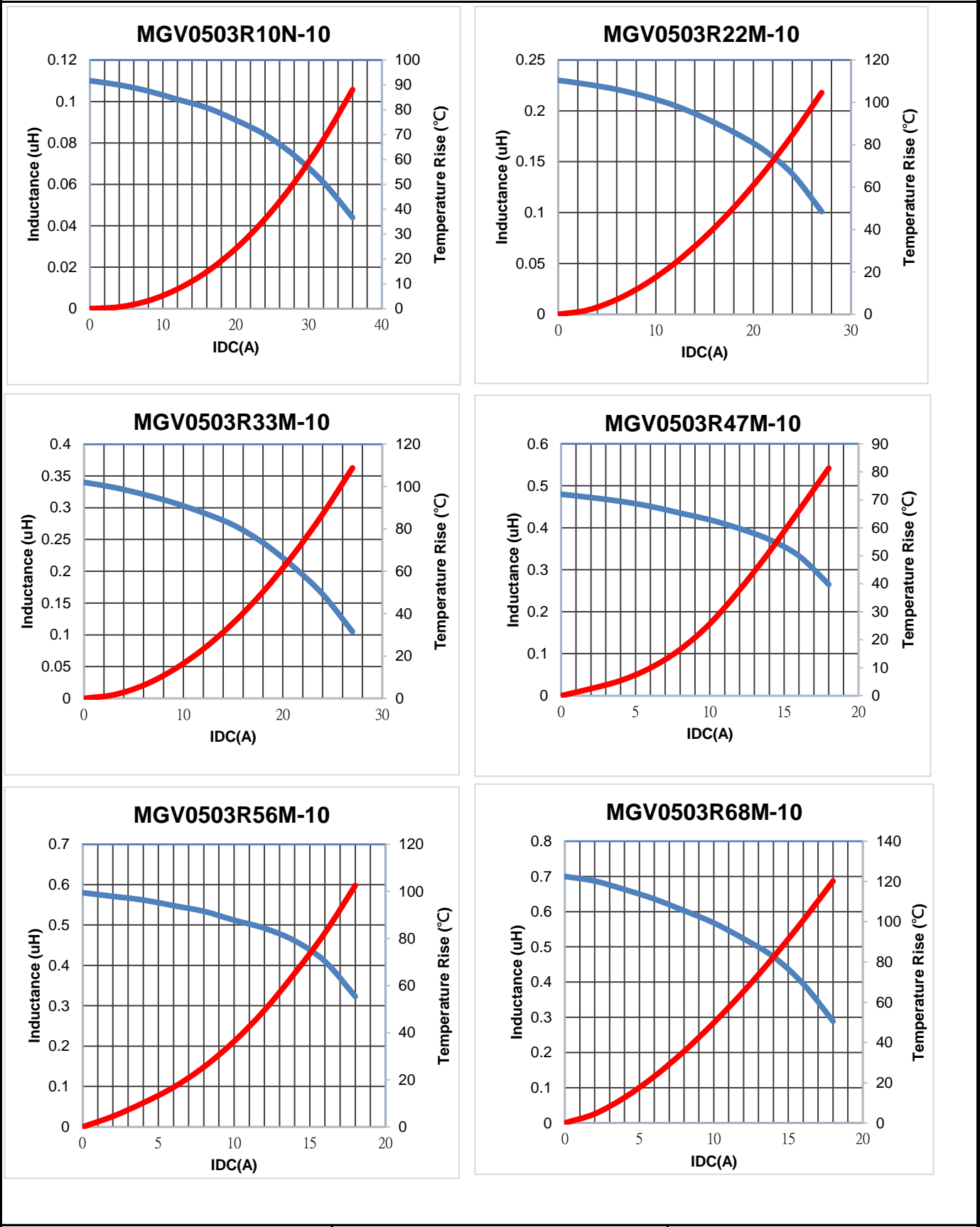
| PART NUMBER | INDUCTANCE (uH) | I _{rms} (A) Typ. | I _{sat} (A) Typ. | DCR(mΩ) Typ | DCR(mΩ) Max | REMARK |
|----------------|-----------------|---------------------------|---------------------------|-------------|-------------|--------|
| MGV0503R10N-10 | 0.10±30% | 23 | 27 | 2.5 | 3.0 | |
| MGV0503R22M-10 | 0.22±20% | 15.5 | 21 | 3.7 | 4.4 | |
| MGV0503R33M-10 | 0.33±20% | 14 | 18 | 4.3 | 5.0 | |
| MGV0503R47M-10 | 0.47±20% | 12 | 16 | 6.4 | 7.4 | |
| MGV0503R56M-10 | 0.56±20% | 10 | 15 | 8 | 10 | |
| MGV0503R68M-10 | 0.68±20% | 8.5 | 14 | 10 | 12 | |
| MGV0503R82M-10 | 0.82±20% | 8.0 | 13 | 11.5 | 13 | |
| MGV05031R0M-10 | 1.00±20% | 7.0 | 11 | 13 | 14 | |
| MGV05031R2M-10 | 1.20±20% | 6.5 | 11 | 14 | 16 | |
| MGV05031R5M-10 | 1.50±20% | 6.0 | 10 | 16 | 25 | |
| MGV05032R2M-10 | 2.20±20% | 5.5 | 9 | 25 | 35 | |
| MGV05033R3M-10 | 3.30±20% | 5.0 | 8 | 32 | 38 | |
| MGV05034R7M-10 | 4.70±20% | 4.6 | 6 | 50 | 53 | |
| MGV05036R8M-10 | 6.80±20% | 4.0 | 4.3 | 68 | 76 | |
| MGV0503100M-10 | 10.0±20% | 2.8 | 3.5 | 110 | 128 | |
| MGV0503150M-10 | 15.0±20% | 2.1 | 2.6 | 165 | 190 | |
| MGV0503220M-10 | 22.0±20% | 1.9 | 1.7 | 220 | 250 | |
| MGV0503330M-10 | 33.0±20% | 1.6 | 1.6 | 380 | 440 | |

GENERAL SPECIFICATION:

- 1, Test conditions(L): 100KHz, 1Vrms
- 2, Operating temperature: -55°C to +125°C (Including self-heating)
- 3, Storage temperature: -10°C to +40°C
- 4, Humidity range: 60% RH Max.
- 5, Heat Rated Current (I_{rms}) will cause the coil temperature rise approximately Δt of 40°C
- 6, Saturation Current (I_{sat}) will cause L₀ to drop approximately 30%.
- 7, Part Temperature (Ambient+Temp. Rise) : Should not exceed 125°C under worst case operating condi
- 8, Storage condition (component in its packaging)

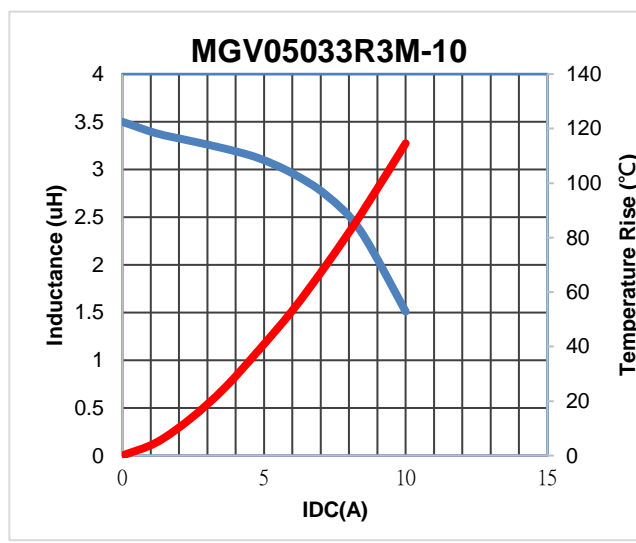
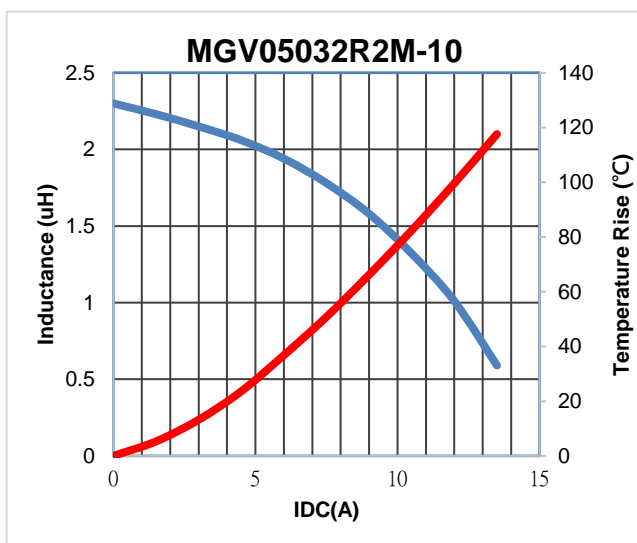
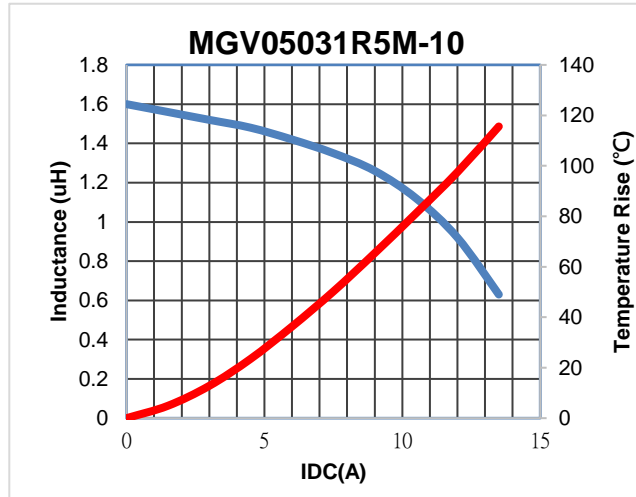
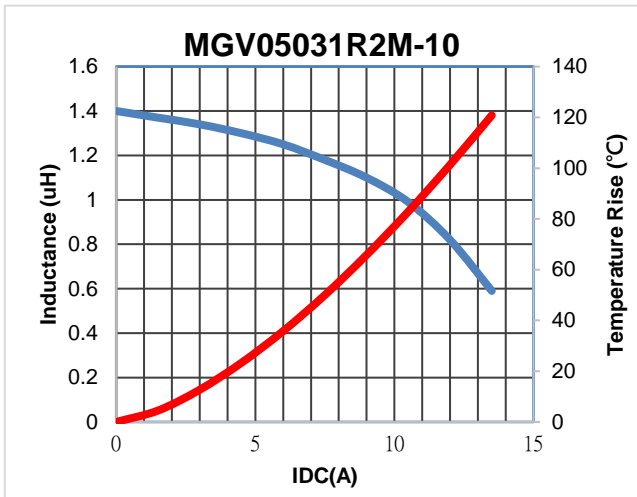
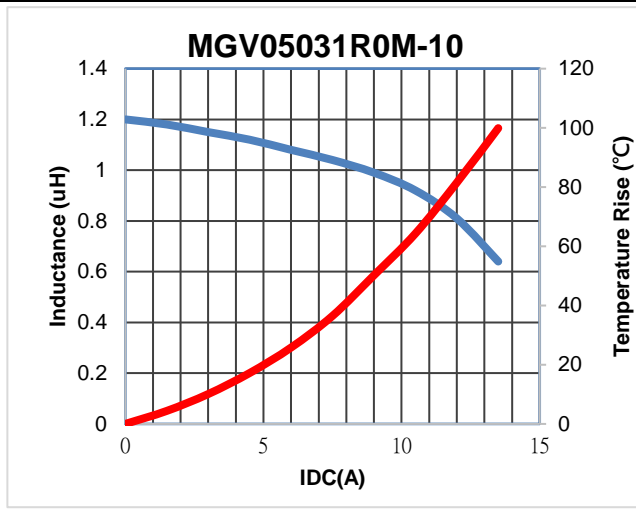
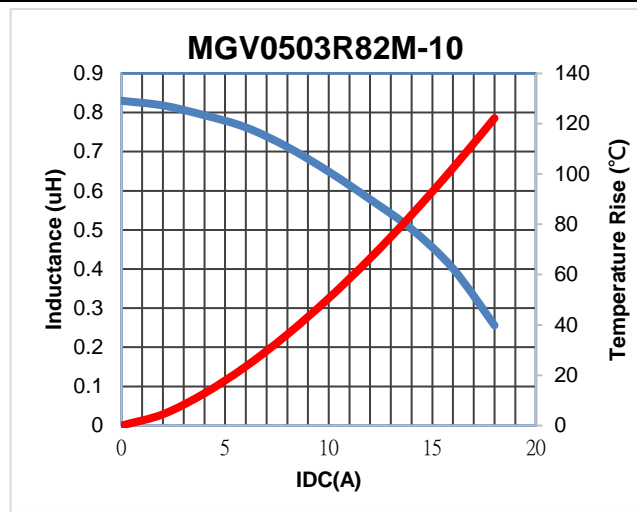
SPECIFICATION FOR APPROVAL

Characteristics Curve



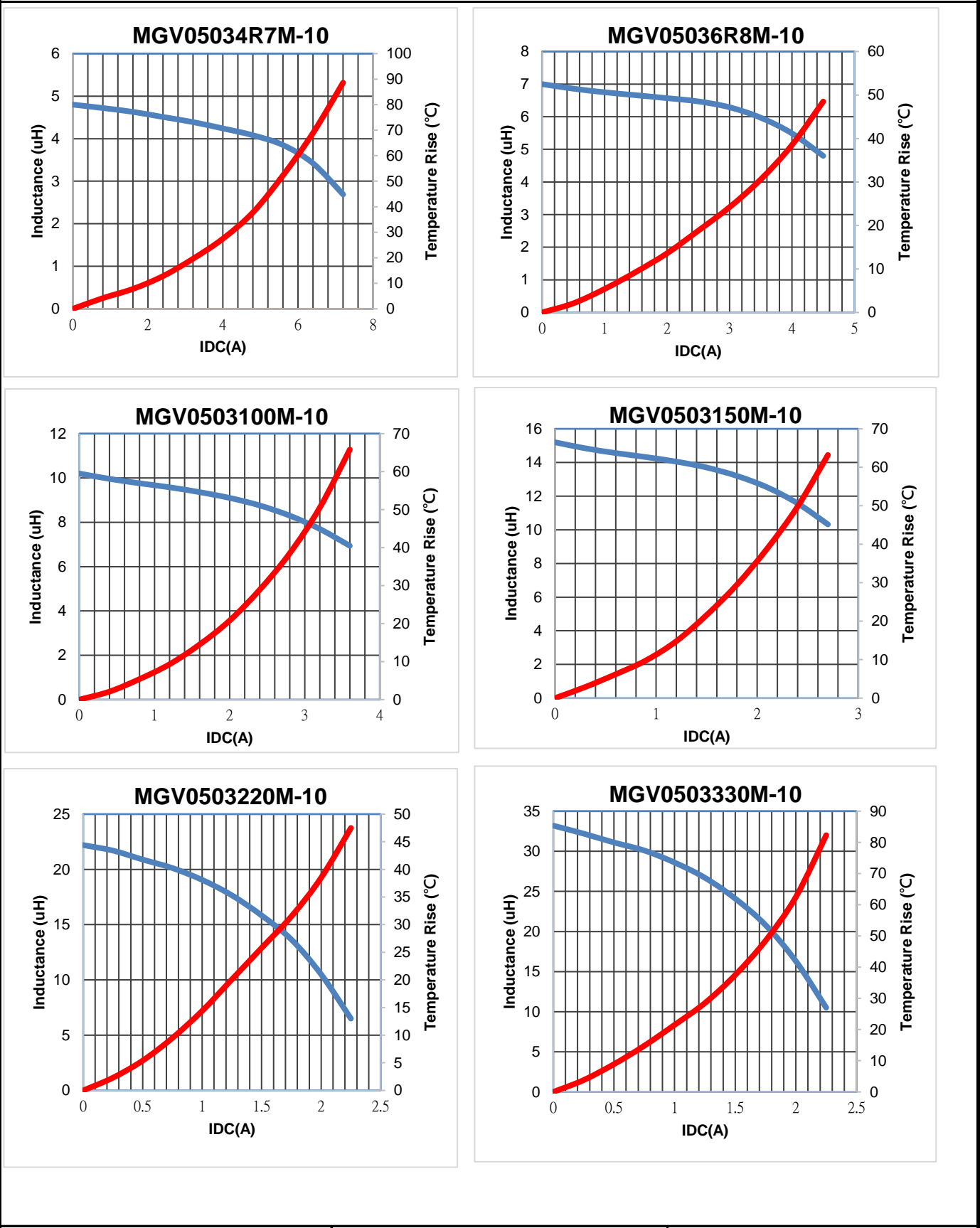
SPECIFICATION FOR APPROVAL

Characteristics Curve



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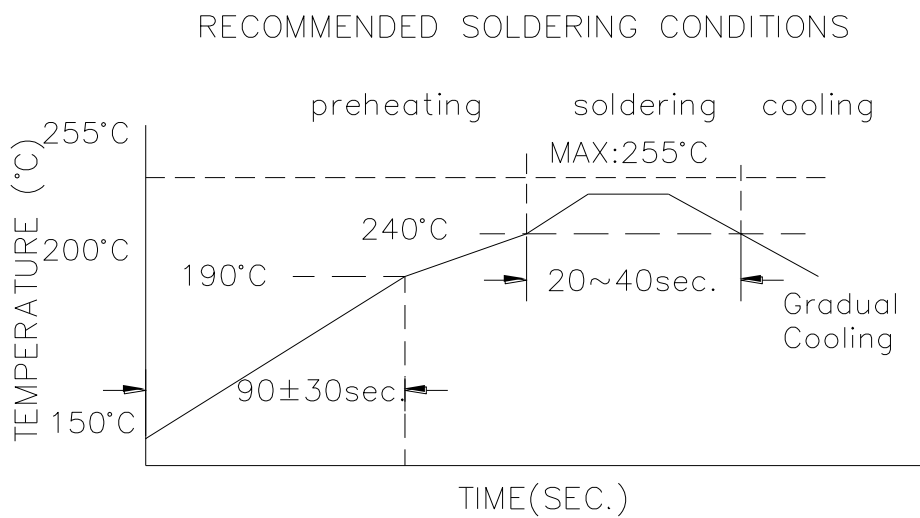
Characteristics Curve



Recommended Soldering Conditions

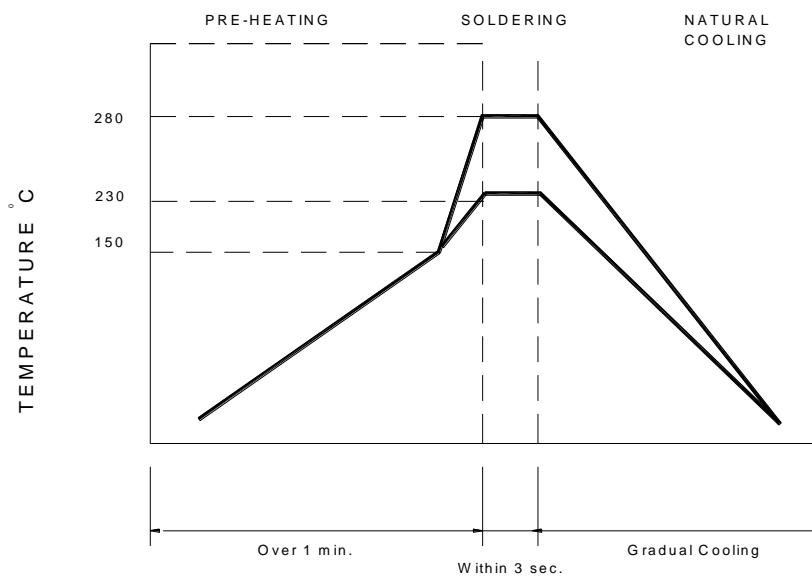
For Lead-Free Application

Figure 1 . Re-flow Soldering



Reflow times: 3 times max

Figure 2 . Hand Soldering



Hand solder times: 1 time max



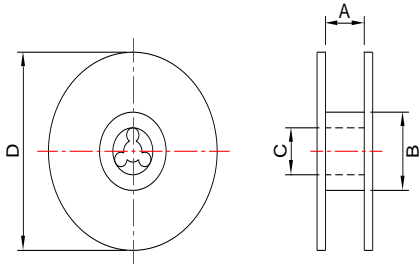
Reliability and Testina Conditions / Pin Type Power Inductors

SMD series(Consumer)

| Item | Reference | Additional Requirements |
|--|--|---|
| Operating temperature range | -55°C ~ +125°C (Including self-temperature rise) | |
| Storage temperature and humidity range | -10°C to +40°C , 60% RH Max | |
| High Temperature Exposure (Storage) | MIL-STD-202 Method 108 | 85±2°C, 168+24hours |
| Temperature Cycling | JESD22 Method JA-104 | -40°C → +85, transforming interval:20s, 100cycles |
| Operational Life | MIL-PRF-2 | 85±°C, 168+24hours Apply maximum rated voltage and current according part drawing |
| External Visual | MIL-STD-883 Method 2009 | Inspect device construction, marking and workmanship. Electrical Test not required. |
| Physical Dimension | JESD22 Method JB-100 | Verify physical dimensions to the applicable device detail specification. Note: User(s) and Suppliers spec. Electrical Test not required |
| Vibration | MIL-STD-202 Method 204 | 10~55Hz,1.5mm, 2 hours in each 3mutually |
| Resistance to Soldering Heat | MIL-STD-202 Method 210 | 1. Max. 260±5°C,10±1s, 2 times 2.Solder Composition: Sn/3Ag/0.5Cu |
| Solderability | J-STD-002 | 245±5°C, 5±1sec, Solder: Sn/3.0Ag/0.5Cu |
| Electrical Characterization | Print Spec | Parametrically test per lot and sample size requirements, summary to show Min, Max, Mean and Standard deviation at room as well as Min and Max Operating temperatures |
| Board Flex | AEC-Q200-005 | 2mm,30±1s |
| Terminal Strength(SMD) | AEC-Q200-006 | 10N, 5S, X,Y direct |

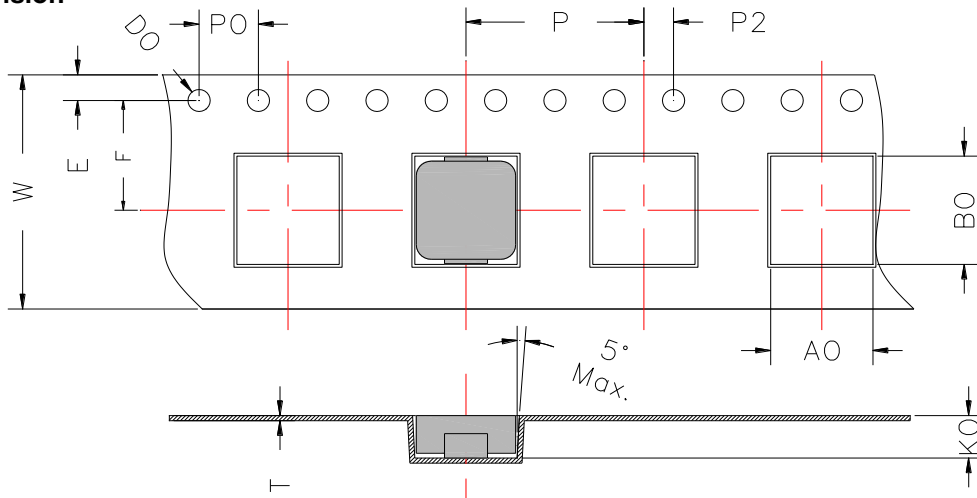
PACKAGING

Reel Dimension



| Type | A(mm) | B(mm) | C(mm) | D(mm) |
|--------|-----------|---------|-------------|-------|
| 13'x12 | 12.4+2/-0 | 100 ± 2 | 13+0.5/-0.2 | 330 |

Tape Dimension

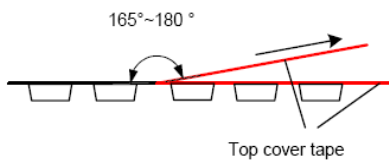


| W | E | F | P | A0 | B0 | P2 | P0 | K0 | t | D0 |
|----------|----------|----------|----------|----------|----------|---------|---------|---------|-----------|--------|
| 12.0±0.3 | 1.75±0.1 | 5.50±0.1 | 8.00±0.1 | 5.50±0.1 | 6.20±0.1 | 2.0±0.1 | 4.0±0.1 | 3.3±0.1 | 0.35±0.05 | 1.5Ref |

Packaging Quantity

| P/N | Chip/Reel |
|----------------|-----------|
| MGV0503 Series | 2000pcs |
| Size | |

Peeling Off Force



| The force peeling off cove tape is 10 to 100 grams in the arrow direction under the following conditions | | | |
|--|---------------|-----------------|---------------|
| Room Temp (°C) | Room Humidity | Room atrn (hPa) | Teaming Speed |
| 5~35 | 45~85 | 860~1060 | 300 |

※Storage Conditions

1. Temperature and humidity conditions: -10-+40°C and 60% RH.
2. Recommended products should be used within 12 mont from the time of manufacturing.
3. The packaging material should be kept where no chlorin or sulfur exists in the air.
4. Allowable stacking condition of Packaging box: max height 1.5m or 5 boxes stacking



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MATERIAL IDENTIFICATION

| ITEM | DESCRIPTION | Spec | SGS No. | SUPPLIERS |
|------|-------------|-------------|-----------------|-----------|
| 1 | Powder | Iron Powder | SCL03H001687001 | Laird |
| 2 | Copper Wire | AIB | SCL01G06040701E | PACIFIC |
| 3 | Coating | Paint | RHS01G006468001 | BERLIN |
| 4 | Clip | Clip | CAN1406178103 | HUIGAO |
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