

# MNR60\*\* Series

## Wire Wound SMD Power Inductors

### FEATURES

- Magnetic-resin shielded construction reduces buzz noise to ultra-low levels
- Metallization on ferrite core results in excellent shock resistance and damage-free durability
- Closed magnetic circuit design reduces leakage flux and Electro Magnetic Interference (EMI)
- 30% higher current rating than conventional inductors of equal size
- Takes up less PCB real estate and save more power
- Operate temperature range ....  $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$  (Including self temp. rise)
- RoHS compliant



### APPLICATIONS

- Smart phone, smart TV, set top box, notebook
- Car navigation systems, telecomm base stations
- VR, AR
- LED lighting

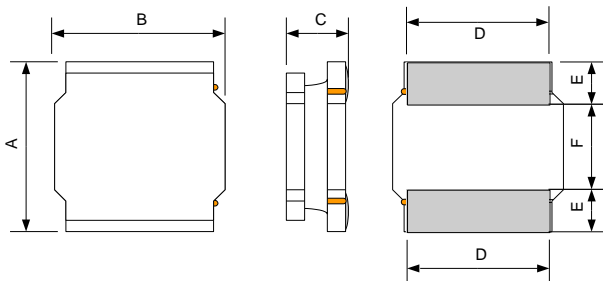
### Explanation of Part Number

MNR 6020 T1R0 M T

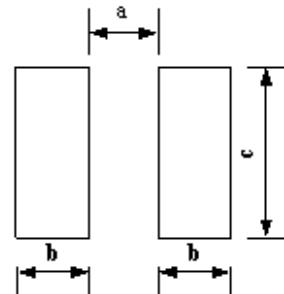
1 2 3 4 5 6

- ◆ 1:Product Series:Wire Wound SMD Power Inductors
- ◆ 2:Dimensions:
- ◆ 3: Feature Type:T Type
- ◆ 4: Initial inductance value: 1R0 = 1.0uH
- ◆ 5: Tolerance of Inductance:M:±20%, N:±30%
- ◆ 6:Packing:Tape Carrier Package

### Dimensions: [mm]



### Recommended Land Pattern



Unit: mm

| Series  | A       | B       | C        | D       | E        | F       | a Typ. | b Typ. | c Typ. |
|---------|---------|---------|----------|---------|----------|---------|--------|--------|--------|
| MNR6020 | 6.0±0.3 | 6.0±0.3 | 2.0 Max. | 4.9±0.3 | 1.55±0.3 | 2.9±0.3 | 2.8    | 1.7    | 5.7    |
| MNR6028 | 6.0±0.3 | 6.0±0.3 | 2.8 Max. | 4.9±0.3 | 1.55±0.3 | 2.9±0.3 | 2.8    | 1.7    | 5.7    |
| MNR6045 | 6.0±0.3 | 6.0±0.3 | 4.5 Max. | 4.9±0.3 | 1.55±0.3 | 2.9±0.3 | 2.8    | 1.7    | 5.7    |

## Electrical Characteristics List

### MNR6020 Series

| Part Number   | Inductance | DC Resistance |       | Self-resonant Frequency | Saturation Current <sup>*3</sup> |      | Heat Rating Current <sup>*4</sup> |      |
|---------------|------------|---------------|-------|-------------------------|----------------------------------|------|-----------------------------------|------|
|               | @100kHz,1V | Max.          | Typ.  | Min.                    | Max.                             | Typ. | Max.                              | Typ. |
| Units         | µH         | Ω             |       | MHz                     | A                                |      | A                                 |      |
| Symbol        | L          | DCR           |       | S.R.F                   | Isat                             |      | Irms                              |      |
| MNR6020TR50NT | 0.50±30%   | 0.018         | 0.014 | 120                     | 4.50                             | 6.00 | 4.00                              | 5.00 |
| MNR6020TR68NT | 0.68±30%   | 0.022         | 0.017 | 115                     | 6.55                             | 7.80 | 3.80                              | 4.80 |
| MNR6020TR82NT | 0.82±30%   | 0.022         | 0.017 | 110                     | 5.30                             | 6.30 | 3.80                              | 4.80 |
| MNR6020T1R0MT | 1.0±20%    | 0.026         | 0.020 | 100                     | 4.15                             | 5.00 | 3.50                              | 4.40 |
| MNR6020T1R2MT | 1.2±20%    | 0.029         | 0.022 | 88                      | 5.90                             | 7.00 | 3.20                              | 4.00 |
| MNR6020T1R5MT | 1.5±20%    | 0.029         | 0.022 | 79                      | 4.25                             | 5.10 | 3.20                              | 4.00 |
| MNR6020T1R8MT | 1.8±20%    | 0.036         | 0.028 | 68                      | 4.85                             | 5.80 | 2.75                              | 3.50 |
| MNR6020T2R0MT | 2.0±20%    | 0.046         | 0.035 | 65                      | 4.10                             | 4.90 | 2.60                              | 3.30 |
| MNR6020T2R2MT | 2.2±20%    | 0.036         | 0.028 | 61                      | 3.75                             | 4.50 | 2.75                              | 3.50 |
| MNR6020T2R7MT | 2.7±20%    | 0.046         | 0.035 | 56                      | 3.90                             | 4.60 | 2.60                              | 3.30 |
| MNR6020T3R3MT | 3.3±20%    | 0.046         | 0.035 | 51                      | 3.15                             | 3.70 | 2.60                              | 3.30 |
| MNR6020T3R9MT | 3.9±20%    | 0.064         | 0.049 | 45                      | 3.25                             | 3.90 | 2.10                              | 2.60 |
| MNR6020T4R3MT | 4.3±20%    | 0.064         | 0.049 | 44                      | 2.70                             | 3.20 | 2.10                              | 2.60 |
| MNR6020T4R7MT | 4.7±20%    | 0.075         | 0.058 | 41                      | 3.00                             | 3.60 | 2.00                              | 2.50 |
| MNR6020T5R6MT | 5.6±20%    | 0.075         | 0.058 | 36                      | 2.40                             | 2.90 | 1.90                              | 2.40 |
| MNR6020T6R2MT | 6.2±20%    | 0.103         | 0.079 | 31                      | 2.30                             | 2.70 | 1.80                              | 2.30 |
| MNR6020T6R8MT | 6.8±20%    | 0.103         | 0.079 | 31                      | 2.20                             | 2.60 | 1.80                              | 2.30 |
| MNR6020T8R2MT | 8.2±20%    | 0.137         | 0.105 | 27                      | 2.10                             | 2.50 | 1.40                              | 1.80 |
| MNR6020T100MT | 10±20%     | 0.137         | 0.105 | 27                      | 1.75                             | 2.10 | 1.40                              | 1.80 |
| MNR6020T120MT | 12±20%     | 0.156         | 0.120 | 25                      | 1.45                             | 1.70 | 1.30                              | 1.60 |
| MNR6020T150MT | 15±20%     | 0.189         | 0.145 | 21                      | 1.20                             | 1.40 | 1.20                              | 1.50 |
| MNR6020T180MT | 18±20%     | 0.234         | 0.180 | 18                      | 1.20                             | 1.40 | 1.08                              | 1.40 |
| MNR6020T220MT | 22±20%     | 0.265         | 0.204 | 16                      | 1.05                             | 1.20 | 1.00                              | 1.30 |
| MNR6020T330MT | 33±20%     | 0.390         | 0.30  | 11                      | 0.95                             | 1.10 | 0.84                              | 1.05 |
| MNR6020T470MT | 47±20%     | 0.559         | 0.430 | 10                      | 0.70                             | 0.90 | 0.80                              | 0.90 |
| MNR6020T331MT | 330±20%    | 3.419         | 2.630 | 3                       | 0.27                             | 0.33 | 0.33                              | 0.39 |

### MNR6028Series

| Part Number   | Inductance | DC Resistance |       | Self-resonant Frequency | Saturation Current <sup>*3</sup> |      | Heat Rating Current <sup>*4</sup> |      |
|---------------|------------|---------------|-------|-------------------------|----------------------------------|------|-----------------------------------|------|
|               | @100kHz,1V | Max.          | Typ.  | Min.                    | Max.                             | Typ. | Max.                              | Typ. |
| Units         | µH         | Ω             |       | MHz                     | A                                |      | A                                 |      |
| Symbol        | L          | DCR           |       | S.R.F                   | Isat                             |      | Irms                              |      |
| MNR6028TR82NT | 0.82±30%   | 0.016         | 0.012 | 97                      | 6.50                             | 9.00 | 5.20                              | 6.00 |
| MNR6028T1R0MT | 1.0±20%    | 0.013         | 0.010 | 70                      | 5.75                             | 7.00 | 5.20                              | 5.70 |
| MNR6028T1R2MT | 1.2±20%    | 0.017         | 0.013 | 69                      | 6.40                             | 7.50 | 4.58                              | 5.00 |
| MNR6028T1R5MT | 1.5±20%    | 0.017         | 0.013 | 65                      | 6.00                             | 6.60 | 4.58                              | 5.00 |
| MNR6028T2R2MT | 2.2±20%    | 0.026         | 0.020 | 48                      | 5.10                             | 5.60 | 3.75                              | 4.10 |
| MNR6028T2R7MT | 2.7±20%    | 0.026         | 0.020 | 48                      | 3.80                             | 4.10 | 3.75                              | 4.10 |
| MNR6028T3R3MT | 3.3±20%    | 0.033         | 0.025 | 41                      | 4.15                             | 4.50 | 3.48                              | 3.80 |
| MNR6028T4R7MT | 4.7±20%    | 0.039         | 0.030 | 35                      | 3.00                             | 3.30 | 3.08                              | 3.40 |

| Part Number   | Inductance | DC Resistance |       | Self-resonant Frequency | Saturation Current <sup>3</sup> |      | Heat Rating Current <sup>4</sup> |      |
|---------------|------------|---------------|-------|-------------------------|---------------------------------|------|----------------------------------|------|
|               | @100kHz,1V | Max.          | Typ.  | Min.                    | Max.                            | Typ. | Max.                             | Typ. |
| Units         | μH         | Ω             |       | MHz                     | A                               |      | A                                |      |
| Symbol        | L          | DCR           |       | S.R.F                   | Isat                            |      | Irms                             |      |
| MNR6028T5R1MT | 5.1±20%    | 0.056         | 0.043 | 32                      | 3.20                            | 3.50 | 2.60                             | 2.80 |
| MNR6028T6R2MT | 6.2±20%    | 0.061         | 0.047 | 30                      | 3.05                            | 3.30 | 2.40                             | 2.60 |
| MNR6028T6R8MT | 6.8±20%    | 0.061         | 0.047 | 27                      | 2.60                            | 3.00 | 2.40                             | 2.60 |
| MNR6028T8R2MT | 8.2±20%    | 0.072         | 0.055 | 24                      | 2.30                            | 2.50 | 2.25                             | 2.50 |
| MNR6028T9R1MT | 9.1±20%    | 0.096         | 0.074 | 24                      | 2.55                            | 2.80 | 2.15                             | 2.40 |
| MNR6028T100MT | 10±20%     | 0.094         | 0.072 | 23                      | 2.04                            | 2.50 | 1.95                             | 2.40 |
| MNR6028T120MT | 12±20%     | 0.104         | 0.080 | 18                      | 1.80                            | 2.00 | 1.85                             | 2.00 |
| MNR6028T150MT | 15±20%     | 0.163         | 0.125 | 18                      | 1.75                            | 1.90 | 1.45                             | 1.60 |
| MNR6028T180MT | 18±20%     | 0.156         | 0.120 | 15                      | 1.52                            | 1.80 | 1.45                             | 1.60 |
| MNR6028T220MT | 22±20%     | 0.182         | 0.140 | 14                      | 1.45                            | 1.80 | 1.40                             | 1.60 |
| MNR6028T270MT | 27±20%     | 0.202         | 0.155 | 13                      | 1.50                            | 1.60 | 1.32                             | 1.40 |
| MNR6028T330MT | 33±20%     | 0.241         | 0.185 | 12                      | 1.35                            | 1.50 | 1.22                             | 1.30 |
| MNR6028T360MT | 36±20%     | 0.280         | 0.215 | 11                      | 1.25                            | 1.40 | 1.13                             | 1.20 |
| MNR6028T390MT | 39±20%     | 0.293         | 0.225 | 11                      | 1.25                            | 1.40 | 1.10                             | 1.20 |
| MNR6028T470MT | 47±20%     | 0.410         | 0.315 | 9.5                     | 1.15                            | 1.30 | 1.06                             | 1.10 |
| MNR6028T560MT | 56±20%     | 0.449         | 0.345 | 8.2                     | 1.05                            | 1.20 | 0.89                             | 1.00 |
| MNR6028T680MT | 68±20%     | 0.468         | 0.360 | 7.7                     | 0.80                            | 0.95 | 0.86                             | 0.95 |
| MNR6028T750MT | 75±20%     | 0.533         | 0.410 | 7.7                     | 0.90                            | 0.99 | 0.81                             | 0.90 |
| MNR6028T820MT | 82±20%     | 0.650         | 0.50  | 7.7                     | 0.80                            | 0.88 | 0.70                             | 0.77 |
| MNR6028T101MT | 100±20%    | 0.650         | 0.50  | 7.1                     | 0.65                            | 0.71 | 0.70                             | 0.77 |
| MNR6028T471MT | 470±20%    | 2.808         | 2.160 | 2.8                     | 0.30                            | 0.33 | 0.40                             | 0.45 |

### MNR6045Series

| Part Number   | Inductance | DC Resistance |       | Self-resonant Frequency | Saturation Current <sup>3</sup> |       | Heat Rating Current <sup>4</sup> |      |
|---------------|------------|---------------|-------|-------------------------|---------------------------------|-------|----------------------------------|------|
|               | @100kHz,1V | Max.          | Typ.  | Min.                    | Max.                            | Typ.  | Max.                             | Typ. |
| Units         | μH         | Ω             |       | MHz                     | A                               |       | A                                |      |
| Symbol        | L          | DCR           |       | S.R.F                   | Isat                            |       | Irms                             |      |
| MNR6045TR47NT | 0.47±30%   | 0.008         | 0.006 | 155                     | 15.00                           | 16.50 | 6.50                             | 6.60 |
| MNR6045TR56NT | 0.56±30%   | 0.008         | 0.006 | 142                     | 14.00                           | 15.00 | 6.50                             | 6.60 |
| MNR6045TR68NT | 0.68±30%   | 0.008         | 0.006 | 99                      | 11.00                           | 12.00 | 5.70                             | 6.50 |
| MNR6045TR82NT | 0.82±30%   | 0.010         | 0.008 | 140                     | 10.35                           | 11.00 | 5.90                             | 6.50 |
| MNR6045T1R0MT | 1.0±20%    | 0.014         | 0.011 | 100                     | 9.85                            | 10.00 | 5.14                             | 5.60 |
| MNR6045T1R2MT | 1.2±20%    | 0.013         | 0.010 | 100                     | 8.35                            | 9.10  | 5.40                             | 5.90 |
| MNR6045T1R3MT | 1.3±20%    | 0.013         | 0.010 | 100                     | 8.35                            | 9.10  | 5.40                             | 5.90 |
| MNR6045T1R5MT | 1.5±20%    | 0.016         | 0.012 | 65                      | 8.80                            | 9.70  | 4.95                             | 5.40 |
| MNR6045T1R8MT | 1.8±20%    | 0.016         | 0.012 | 74                      | 7.60                            | 8.40  | 4.95                             | 5.40 |
| MNR6045T2R2MT | 2.2±20%    | 0.018         | 0.014 | 52                      | 6.75                            | 7.40  | 4.60                             | 5.00 |
| MNR6045T2R3MT | 2.3±20%    | 0.027         | 0.021 | 60                      | 6.00                            | 6.60  | 3.50                             | 3.80 |
| MNR6045T2R7MT | 2.7±20%    | 0.020         | 0.015 | 38                      | 5.75                            | 6.30  | 4.30                             | 4.70 |
| MNR6045T3R0MT | 3.0±20%    | 0.026         | 0.020 | 35                      | 5.60                            | 6.20  | 3.80                             | 4.20 |
| MNR6045T3R3MT | 3.3±20%    | 0.027         | 0.021 | 32                      | 5.90                            | 6.20  | 3.70                             | 4.00 |
| MNR6045T3R6MT | 3.6±20%    | 0.027         | 0.021 | 28                      | 5.25                            | 5.70  | 3.70                             | 4.00 |
| MNR6045T4R3MT | 4.3±20%    | 0.030         | 0.023 | 23                      | 4.45                            | 4.90  | 3.50                             | 3.80 |
| MNR6045T4R5MT | 4.5±20%    | 0.034         | 0.026 | 24                      | 4.97                            | 5.50  | 3.30                             | 3.60 |
| MNR6045T4R7MT | 4.7±20%    | 0.034         | 0.026 | 24                      | 4.97                            | 5.50  | 3.30                             | 3.60 |

| Part Number   | Inductance | DC Resistance |       | Self-resonant Frequency | Saturation Current <sup>*3</sup> |       | Heat Rating Current <sup>*4</sup> |       |
|---------------|------------|---------------|-------|-------------------------|----------------------------------|-------|-----------------------------------|-------|
|               | @100kHz,1V | Max.          | Typ.  | Min.                    | Max.                             | Typ.  | Max.                              | Typ.  |
| Units         | μH         | Ω             |       | MHz                     | A                                |       | A                                 |       |
| Symbol        | L          | DCR           |       | S.R.F                   | Isat                             |       | Irms                              |       |
| MNR6045T5R1MT | 5.1±20%    | 0.034         | 0.026 | 23                      | 4.40                             | 4.80  | 3.30                              | 3.60  |
| MNR6045T5R6MT | 5.6±20%    | 0.038         | 0.029 | 23                      | 4.15                             | 4.60  | 3.15                              | 3.40  |
| MNR6045T6R2MT | 6.2±20%    | 0.040         | 0.031 | 26                      | 4.43                             | 4.80  | 3.00                              | 3.30  |
| MNR6045T6R3MT | 6.3±20%    | 0.040         | 0.031 | 26                      | 4.43                             | 4.70  | 3.00                              | 3.30  |
| MNR6045T6R8MT | 6.8±20%    | 0.040         | 0.031 | 20                      | 3.90                             | 4.30  | 3.00                              | 3.30  |
| MNR6045T7R5MT | 7.5±20%    | 0.044         | 0.034 | 18                      | 3.50                             | 3.80  | 2.90                              | 3.20  |
| MNR6045T8R2MT | 8.2±20%    | 0.056         | 0.043 | 21                      | 3.90                             | 4.30  | 2.60                              | 2.80  |
| MNR6045T9R1MT | 9.1±20%    | 0.056         | 0.043 | 17                      | 3.35                             | 3.70  | 2.60                              | 2.80  |
| MNR6045T100MT | 10±20%     | 0.062         | 0.048 | 15                      | 3.20                             | 3.50  | 2.45                              | 2.70  |
| MNR6045T120MT | 12±20%     | 0.075         | 0.058 | 13                      | 2.80                             | 3.00  | 2.20                              | 2.40  |
| MNR6045T150MT | 15±20%     | 0.088         | 0.068 | 12                      | 2.50                             | 2.70  | 2.05                              | 2.20  |
| MNR6045T180MT | 18±20%     | 0.105         | 0.081 | 10                      | 2.20                             | 2.40  | 1.85                              | 2.00  |
| MNR6045T220MT | 22±20%     | 0.116         | 0.089 | 10                      | 2.05                             | 2.20  | 1.80                              | 2.00  |
| MNR6045T270MT | 27±20%     | 0.133         | 0.102 | 9.2                     | 1.90                             | 2.10  | 1.65                              | 1.80  |
| MNR6045T300MT | 30±20%     | 0.172         | 0.132 | 7.8                     | 1.70                             | 1.80  | 1.50                              | 1.60  |
| MNR6045T330MT | 33±20%     | 0.178         | 0.137 | 7.8                     | 1.65                             | 1.80  | 1.45                              | 1.60  |
| MNR6045T360MT | 36±20%     | 0.225         | 0.173 | 7.8                     | 1.62                             | 1.80  | 1.40                              | 1.50  |
| MNR6045T390MT | 39±20%     | 0.234         | 0.180 | 7.8                     | 1.50                             | 1.60  | 1.25                              | 1.40  |
| MNR6045T430MT | 43±20%     | 0.260         | 0.20  | 7.7                     | 1.63                             | 1.80  | 1.20                              | 1.30  |
| MNR6045T470MT | 47±20%     | 0.260         | 0.20  | 6.4                     | 1.40                             | 1.50  | 1.20                              | 1.30  |
| MNR6045T510MT | 51±20%     | 0.269         | 0.207 | 6.4                     | 1.35                             | 1.50  | 1.15                              | 1.20  |
| MNR6045T560MT | 56±20%     | 0.287         | 0.221 | 6.4                     | 1.30                             | 1.40  | 1.10                              | 1.20  |
| MNR6045T620MT | 62±20%     | 0.306         | 0.235 | 6.4                     | 1.25                             | 1.40  | 1.10                              | 1.20  |
| MNR6045T680MT | 68±20%     | 0.376         | 0.289 | 6.4                     | 1.20                             | 1.30  | 1.00                              | 1.10  |
| MNR6045T750MT | 75±20%     | 0.397         | 0.305 | 5                       | 1.15                             | 1.20  | 0.95                              | 1.00  |
| MNR6045T820MT | 82±20%     | 0.443         | 0.341 | 4.9                     | 1.05                             | 1.10  | 0.90                              | 0.99  |
| MNR6045T910MT | 91±20%     | 0.467         | 0.359 | 4.9                     | 1.00                             | 1.10  | 0.85                              | 0.94  |
| MNR6045T101MT | 100±20%    | 0.563         | 0.433 | 4.2                     | 0.95                             | 1.00  | 0.80                              | 0.88  |
| MNR6045T121MT | 120±20%    | 0.629         | 0.484 | 4.2                     | 0.85                             | 0.94  | 0.77                              | 0.85  |
| MNR6045T151MT | 150±20%    | 0.754         | 0.580 | 4.2                     | 0.80                             | 0.88  | 0.70                              | 0.77  |
| MNR6045T221MT | 220±20%    | 1.084         | 0.834 | 3.5                     | 0.70                             | 0.77  | 0.59                              | 0.65  |
| MNR6045T331MT | 330±20%    | 1.651         | 1.270 | 2.8                     | 0.57                             | 0.63  | 0.57                              | 0.63  |
| MNR6045T471MT | 470±20%    | 2.340         | 1.80  | 2.0                     | 0.500                            | 0.560 | 0.420                             | 0.480 |
| MNR6045T681MT | 680±20%    | 3.250         | 2.50  | 1.7                     | 0.420                            | 0.460 | 0.330                             | 0.380 |

※1: All test data is referenced to 20°C ambient;

※2: Rated current: Isat or Irms, whichever is smaller;

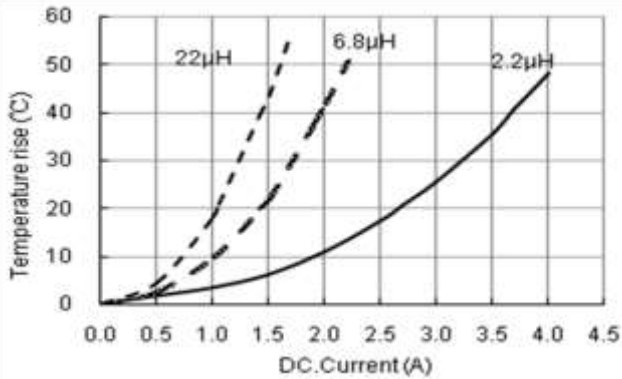
※\*3: Isat: DC current at which the inductance drops approximate 30% from its value without current;

※\*4: Irms: DC current that causes the temperature rise ( $\Delta T = 40^\circ\text{C}$ ) from 20°C ambient.

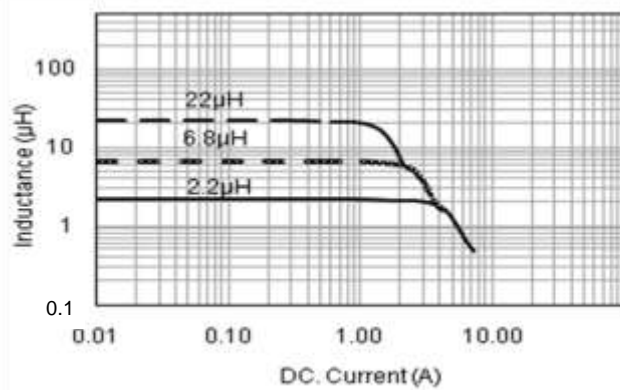
## TYPICAL ELECTRICAL CHARACTERISTICS

### MNR6020 Series

Temperature vs. DC Current Characteristics

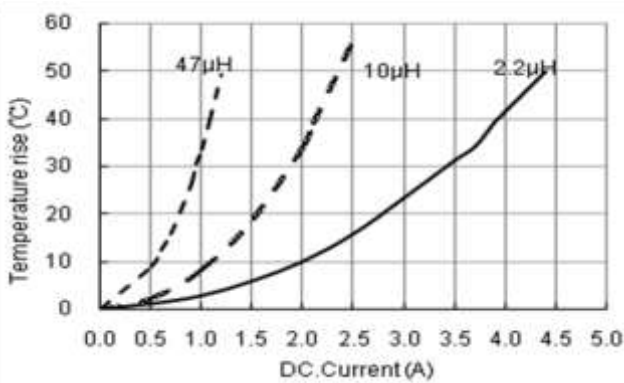


Inductance vs. DC Current Characteristics

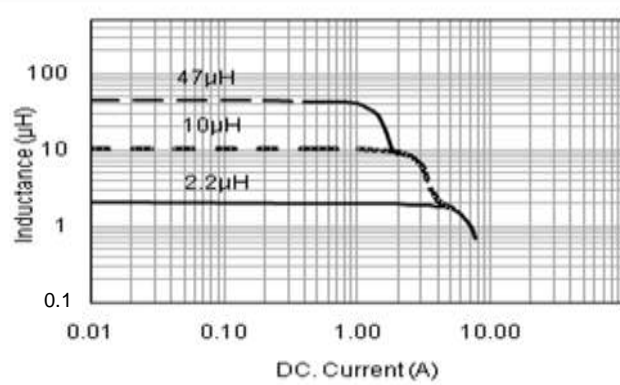


### MNR6028 Series

Temperature vs. DC Current Characteristics

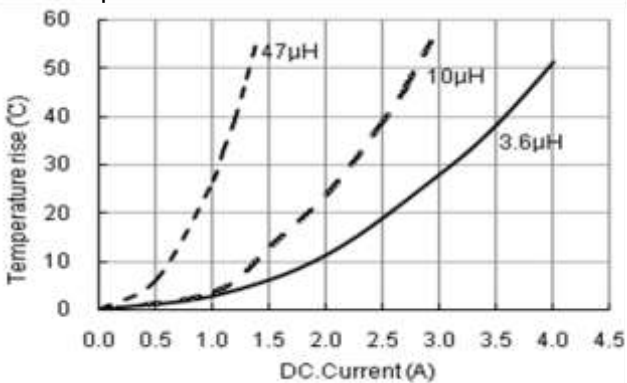


Inductance vs. DC Current Characteristics

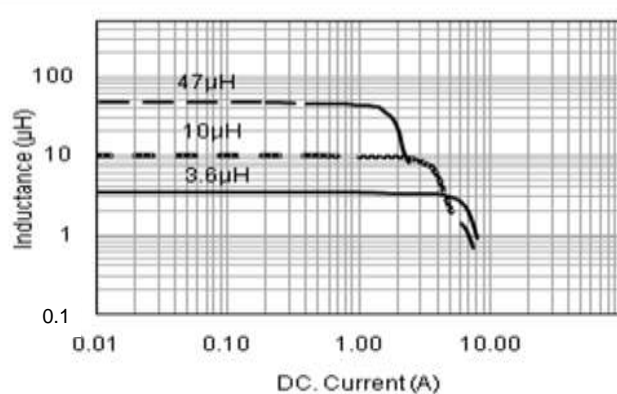


### MNR6045 Series

Temperature vs. DC Current Characteristics



Inductance vs. DC Current Characteristics



## Reliability Test

| TEST ITEM                             | SPECIFICATION   | TEST CONDITION   |
|---------------------------------------|---|--|
| Withstanding voltage test             | After test, inductors shall have no evidence of electrical and mechanical damage.   | AC voltage of 100v and AC current of 1mA applied between inductor's terminal and core for 3 secs.  |
| Resistance to soldering heat          | 1. Inductor shall have no evidence of electrical and mechanical damage.<br>2. Inductance shall not change more than $\pm 5\%$ .<br>3. Q shall not change more than 20%. | a. Temp: $260 \pm 5$<br>b. Time: $10 \pm 1.0$ se   |
| Solderability test                    | The terminal shall be at least 95% covered with solder.   | After fluxing, the terminal shall be dipped in a melted solder bath at $245 \pm 5^\circ\text{C}$ for $4 \pm 1.0$ secs.   |
| High temperature & high humidity test | The anti-erosion quality of the surface and the specimen's inductance shall not change from the initial value within $\pm 10\%$   | a. Test condition<br>1)Temp.: $85^\circ\text{C}$ , R.H.:85%<br>2)Time: $144 \pm 2$ hours<br>b. Measurement method<br>The experimental component should be put at normal condition for 2 hours then to measure again after test                         |
| Salt spray test                       |   | a. Test condition<br>1)Temp.: $35 \pm 2^\circ\text{C}$<br>2)Time: $48 \pm 2$ hours<br>3)Salt solution PH:6.5~7.2<br>b. Measurement method<br>The experimental component should be put at normal condition for 2 hours then to measure again after test |
| Vibration test                        | 1. Inductance shall be within 10% of the initial value.<br>2. Appearance: no damage   | a. Frequency: 10 to 55<br>b. Amplitude: 1.5<br>c. Direction and time<br>X, Y and Z directions for 2 hours each.  |

| TEST ITEM                        | SPECIFICATION  | TEST CONDITION   |
|----------------------------------|--|--|
| Free fall test                   | No mechanical damage shall be noticed.   | Drop 5 times on a concrete floor from 1m the height  |
| Temperature Cycling test         | 1. Inductance shall be within 10% of the initial value<br>2. Appearance: No dama | a. Test conditi<br>1)Temp.: $-55^{\circ}\text{C}$ ,time: $30\pm 3\text{min}$<br>2)Temp.: $+125^{\circ}\text{C}$ ,time: $30\pm 3\text{min}$<br>3)Cycles times:12 cycles<br>b. Measurement method<br>The experimental component should be put at normal condition for 2 hours then to measure again after test |
| High Temperature resistance test |  | a. Test conditi<br>1)Applied rated current<br>2)Temp.: $85^{\circ}\text{C}\pm 2^{\circ}\text{C}$<br>3)Test time: $1000+24/-0\text{H}$<br>b. Measurement method<br>The experimental component should be put at normal condition for 24 hours then to measure again after test.                                |
| Low temperature resistance test  |  | a. Test conditi<br>1)Temp.: $-55^{\circ}\text{C}\pm 2^{\circ}\text{C}$<br>2)Test time: $1000+24/-0\text{H}$<br>b. Measurement method<br>The experimental component should be put at normal condition for 24 hours then to measure again after test.  |

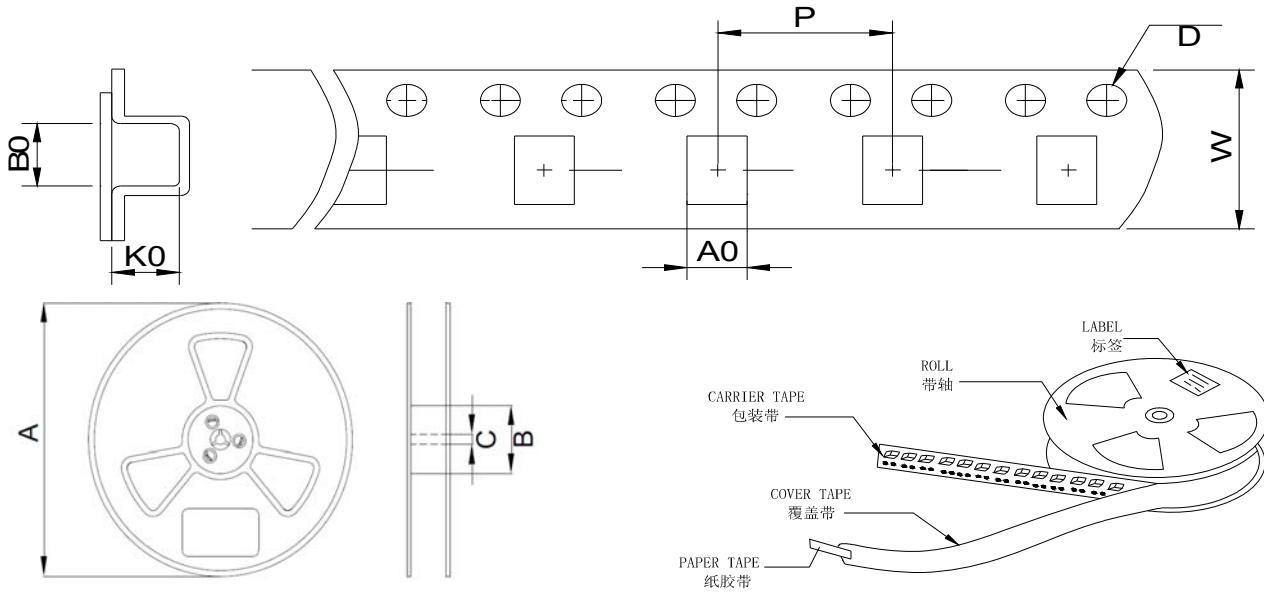
We have suggested the storage period of lead-free product should not over 6 months.

### Structure (The structure of product.)

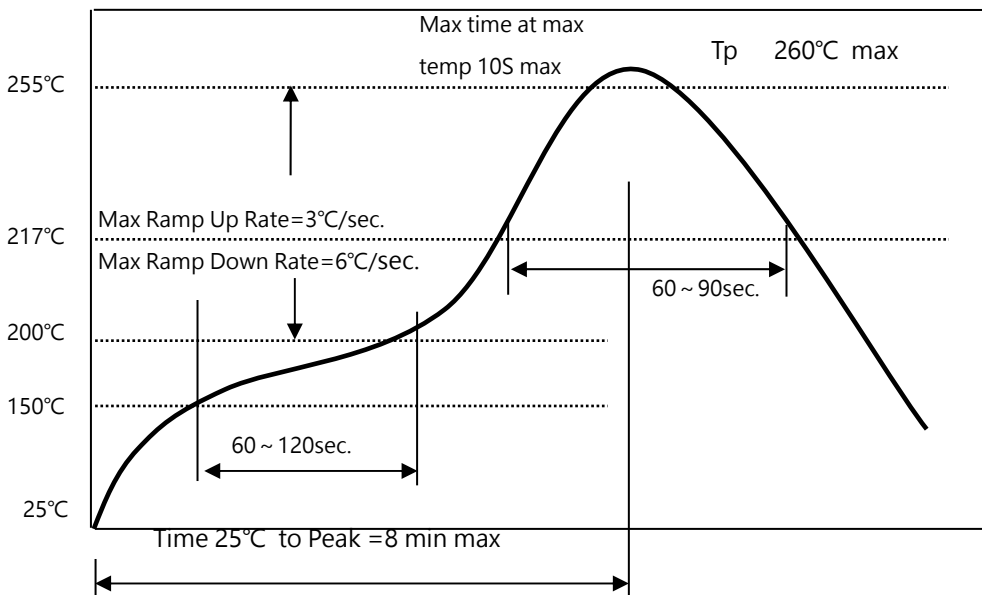


| NO | Components    | Material                                 |
|----|---------------|--|
| ①  | Core          | Ni-Zn Ferrite                            |
| ②  | Wire          | Polyurethane system enameled copper wire |
| ③  | Magnetic Glue | Epoxy resin and magnetic powder          |
| ④  | Plating       | AgNiSn or FeNiCu + Sn Alloy              |



**PACKAGING SPECIFICATION :**


| Type    | Tape Dimension (mm) |     |     |      |     |   | Reel Dimension (mm) |     |    | Quantity (Pcs/Reel) |
|---------|---------------------|-----|-----|------|-----|---|---------------------|-----|----|---------------------|
|         | W                   | A0  | B0  | K0   | D   | P | A                   | B   | C  |                     |
| MNR6020 | 16                  | 6.4 | 6.4 | 2.2  | 1.5 | 8 | 330                 | 100 | 13 | 2500                |
| MNR6028 | 16                  | 6.4 | 6.4 | 3.1  | 1.5 | 8 | 330                 | 100 | 13 | 2000                |
| MNR6045 | 16                  | 6.4 | 6.4 | 4.75 | 1.5 | 8 | 330                 | 100 | 13 | 1500                |

**Re-flowing Profile:**




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