

## MPN252012S Series

### Metal Alloy Wire Wound SMD Power Inductors

#### FEATURES

- Fe base metal material core provides large saturation current
- 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)
- Low DCR decreases power loss, small and slim take up less PCB real estate
- Automatic production ensures high quality and consistency
- Operate temperature range ....  $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$  (Including self temp. rise)
- RoHS compliant



#### APPLICATIONS

- Smart phone, set top box, VR, AR
- Notebooks, desktop computers, servers
- Portable gaming devices, personal navigation systems, personal multimedia devices

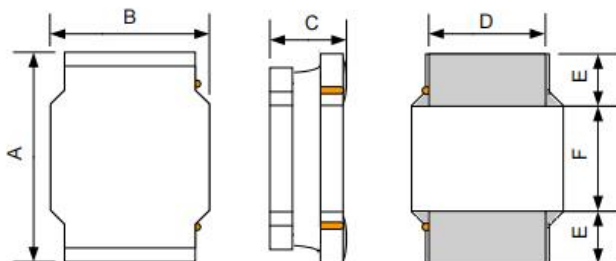
#### Explanation of Part Number

MPN 252012 S 1R0 M T

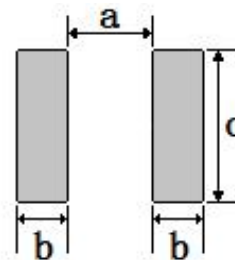
1 2 3 4 5 6

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

#### SHAPE AND DIMENSIONS [mm]



#### Recommended Land Pattern



| Series     | A       | B       | C        | D       | E       | F       | a Typ. | b Typ. | c Typ. |
|------------|---------|---------|----------|---------|---------|---------|--------|--------|--------|
| MPN252012S | 2.5±0.3 | 2.0±0.3 | 1.2 Max. | 2.0±0.2 | 0.8±0.2 | 0.8±0.2 | 0.80   | 0.85   | 2.0    |

## Electrical Characteristics List

| Part Number     | Inductance     | DC Resistance |          | Isat(A) |      | Irms(A) |      |
|-----------------|----------------|---------------|----------|---------|------|---------|------|
|                 | 1MHz/0.1V      | Max.          | Typ.     | Max.    | Typ. | Max.    | Typ. |
| Units           | ( $\mu$ H)     | $\Omega$      | $\Omega$ | A       | A    | A       | A    |
| MPN252012SR24NT | 0.24 $\pm$ 30% | 0.023         | 0.019    | 6.50    | 7.80 | 4.05    | 4.70 |
| MPN252012SR33NT | 0.33 $\pm$ 30% | 0.035         | 0.028    | 5.35    | 6.30 | 3.70    | 4.30 |
| MPN252012SR47NT | 0.47 $\pm$ 30% | 0.035         | 0.029    | 4.90    | 5.60 | 3.45    | 4.00 |
| MPN252012SR68NT | 0.68 $\pm$ 30% | 0.045         | 0.039    | 3.80    | 4.50 | 3.10    | 3.60 |
| MPN252012S1R0NT | 1.0 $\pm$ 30%  | 0.054         | 0.048    | 3.60    | 4.20 | 3.00    | 3.40 |
| MPN252012S1R5NT | 1.5 $\pm$ 30%  | 0.100         | 0.090    | 2.90    | 3.50 | 2.40    | 2.80 |
| MPN252012S2R2MT | 2.2 $\pm$ 20%  | 0.120         | 0.100    | 2.60    | 3.00 | 1.90    | 2.15 |
| MPN252012S3R3MT | 3.3 $\pm$ 20%  | 0.215         | 0.175    | 1.70    | 2.10 | 1.50    | 1.80 |
| MPN252012S4R7MT | 4.7 $\pm$ 20%  | 0.260         | 0.240    | 1.60    | 1.90 | 1.25    | 1.45 |
| MPN252012S6R8MT | 6.8 $\pm$ 20%  | 0.366         | 0.335    | 1.20    | 1.40 | 0.95    | 1.10 |
| MPN252012S8R2MT | 8.2 $\pm$ 21%  | 0.460         | 0.405    | 1.15    | 1.36 | 0.88    | 1.06 |
| MPN252012S100MT | 10 $\pm$ 20%   | 0.480         | 0.465    | 1.10    | 1.35 | 0.85    | 1.00 |

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

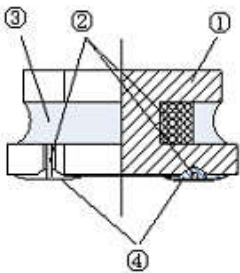
※2: Rated current: Isat or Irms, whichever is smaller;

※3: For MPN252012 size inductors, absolute maximum voltage: DC 25V;

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

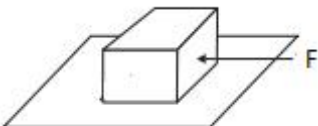
※Irms: DC current that causes the temperature rise ( $\Delta T = 40^\circ\text{C}$ ) from 20°C ambient.

## Structure

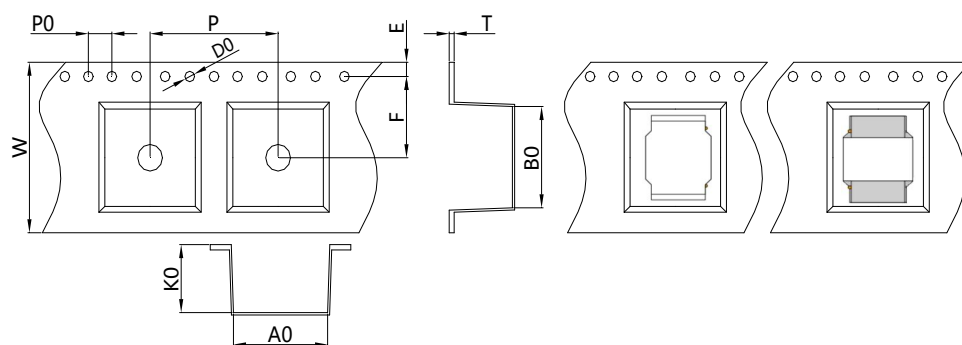


| NO. | Components    | Material                                 |
|-----|---------------|------------------------------------------|
| ①   | Core          | Soft magnetic Metal                      |
| ②   | Wire          | Polyurethane system enameled copper wire |
| ③   | Magnetic Glue | Epoxy resin and magnetic powder          |
| ④   | Electrodes    | AgNiSn or FeNiCu + Sn Alloy              |

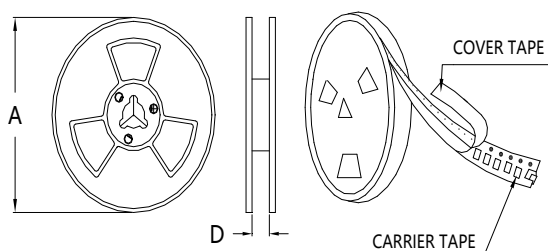
## Reliability Test

| No. | TEST ITEM                        | SPECIFICATION                                                                                                                          | TEST CONDITION                                                                                                                                                                                                                          |
|-----|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | High temperature Storage test    | 1. No significant defects in appearance.<br>2. $\Delta L/L \leq 10\%$<br>3. $\Delta DCR/DCR \leq 10\%$                                 | Temperature: $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ (N: Follow the product specification for the setting.)<br>Time : $96 \pm 2$ hours<br>Place the samples for one hour at room temperature and test them within two hours         |
| 2   | Low temperature Storage test     | 1. No significant defects in appearance.<br>2. $\Delta L/L \leq 10\%$<br>3. $\Delta DCR/DCR \leq 10\%$                                 | Temperature: $-40^{\circ}\text{C} \pm 5^{\circ}\text{C}$ (M: Follow the product specification for the setting)<br>Time : $96 \pm 2$ hours<br>Place the samples for one hour at room temperature and test them within two hours.         |
| 3   | Humidity test                    | 1. No significant defects in appearance.<br>2. $\Delta L/L \leq 10\%$<br>3. $\Delta DCR/DCR \leq 10\%$                                 | Temperature: $40 \pm 2^{\circ}\text{C}$ , Humidity: $93 \pm 3\% \text{RH}$<br>Time : $96 \pm 2$ hours<br>Place the samples for one hour at room temperature and test them within two hours                                              |
| 4   | Solderability test               | Terminals must have 95% minimum solder coverage                                                                                        | 1. Dip pads in flux then dip in solder pot at $245 \pm 5^{\circ}\text{C}$ for 5 second.<br>2. Solder: lead free<br>3. Flux: rosin flux                                                                                                  |
| 5   | Heat endurance of flow soldering | 1. No significant defects in appearance.<br>2. $\Delta L/L \leq 10\%$<br>3. $\Delta DCR/DCR \leq 10\%$                                 | 1. Refer to the above reflow curve and go through the reflow for twice.<br>2. The peak temperature : $260 + 0/-5^{\circ}\text{C}$                                                                                                       |
| 6   | Vibration test                   | 1. No significant defects in appearance.<br>2. No short and no open.                                                                   | Apply frequency 10~55~10Hz and amplitude 1.5mm, 1 min/cycle in X Y and Z direction for 2 hours each. (total 6 hours)                                                                                                                    |
| 7   | Terminal strength push test      | 1. Applied force: 10N Duration: 10sec<br>2. Solder paste thickness: 0.12mm<br>3. Meet the above requirements without any loose termina | Solder the test samples to the PCB through $245^{\circ}\text{C}$ reflow, apply a standard force on the side of the test samples for 10 seconds.<br> |

## PACKAGING SPECIFICATION :



| Size   | Item | W        | A0       | B0       | K0       | P        | T        | E        | F        | D0       | P0       |
|--------|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 252012 | (mm) | 8.00±0.3 | 2.35±0.2 | 2.65±0.2 | 1.40±0.1 | 4.00±0.1 | 0.25±0.1 | 1.75±0.1 | 3.50±0.1 | 1.50±0.1 | 4.00±0.2 |



|   |          |
|---|----------|
|   | 7"       |
| A | Φ178±2.0 |
| D | 8.5      |

**Packing Quantity:2000pcs/Reel**

## Re-flowing Profile:

