

# Multilayer Chip Power Inductor – MCL-A Series

Operating Temp. : -40°C~+125°C



## FEATURES

- Monolithic structure for high reliability
- Excellent solderability and high heat resistance
- No cross coupling due to magnetic shield
- High DC bias current due to developed material
- Low DC resistance

## APPLICATIONS

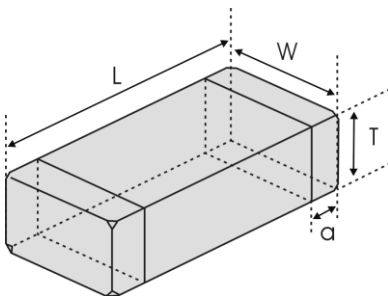
- DC-DC converter circuits for mobile phones, wearable devices, DVCs, HDDs, etc

## PRODUCT IDENTIFICATION

| <u>MCL</u>   | <u>2012</u>         | <u>A</u>           | <u>2R2</u> | <u>M</u> | <u>T</u>            |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
|--|---------------------|--------------------|------------|----------|---------------------|---|-------|--------------------------------|--|---|----------|----------------------|---------|-------------|---------|---|--|--------------|--|---|----------------|
| ①  | ②                   | ③                  | ④          | ⑤        | ⑥                   |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
| ①  | ②                   |                    | ③          |          | ④                   |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
| <table border="1"> <tr><th colspan="2">Type</th></tr> <tr><td>MCL</td><td>Chip Power Inductor</td></tr> </table>   |                     | Type               |            | MCL      | Chip Power Inductor | <table border="1"> <tr><th colspan="2">External Dimensions (LxW) (mm)</th></tr> <tr><td>2012 [0805]</td><td>2.0x1.25</td></tr> <tr><td>2016 [0806]</td><td>2.0x1.6</td></tr> <tr><td>2520 [1008]</td><td>2.5x2.0</td></tr> </table> |       | External Dimensions (LxW) (mm) |  | 2012 [0805]   | 2.0x1.25 | 2016 [0806]          | 2.0x1.6 | 2520 [1008] | 2.5x2.0 | <table border="1"> <tr><th colspan="2">Feature Type</th></tr> <tr><td>A</td><td>Inner Code</td></tr> </table>       |  | Feature Type |  | A | Inner Code     |
| Type   |                     |                    |            |          |                     |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
| MCL  | Chip Power Inductor |                    |            |          |                     |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
| External Dimensions (LxW) (mm)   |                     |                    |            |          |                     |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
| 2012 [0805]  | 2.0x1.25            |                    |            |          |                     |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
| 2016 [0806]  | 2.0x1.6             |                    |            |          |                     |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
| 2520 [1008]  | 2.5x2.0             |                    |            |          |                     |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
| Feature Type   |                     |                    |            |          |                     |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
| A  | Inner Code          |                    |            |          |                     |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
| ④  |                     | ⑤                  |            | ⑥        |                     |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
| <table border="1"> <tr><th colspan="2">Nominal Inductance</th></tr> <tr><th>Example</th><th>Nominal Value</th></tr> <tr><td>2R2</td><td>2.2μH</td></tr> <tr><td colspan="2">※R= decimal point</td></tr> </table> |                     | Nominal Inductance |            | Example  | Nominal Value       | 2R2   | 2.2μH | ※R= decimal point              |  | <table border="1"> <tr><th colspan="2">Inductance Tolerance</th></tr> <tr><td>M</td><td>±20%</td></tr> </table> |          | Inductance Tolerance |         | M           | ±20%    | <table border="1"> <tr><th colspan="2">包装 Packing</th></tr> <tr><td>T</td><td>编带 Tape &amp; Reel</td></tr> </table> |  | 包装 Packing   |  | T | 编带 Tape & Reel |
| Nominal Inductance   |                     |                    |            |          |                     |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
| Example  | Nominal Value       |                    |            |          |                     |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
| 2R2  | 2.2μH               |                    |            |          |                     |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
| ※R= decimal point  |                     |                    |            |          |                     |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
| Inductance Tolerance   |                     |                    |            |          |                     |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
| M  | ±20%                |                    |            |          |                     |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
| 包装 Packing   |                     |                    |            |          |                     |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |
| T  | 编带 Tape & Reel      |                    |            |          |                     |   |       |                                |  |   |          |                      |         |             |         |   |  |              |  |   |                |

## SHAPE AND DIMENSIONS

Unit: mm [inch]



| Type                | L   | W                                       | T                       | a                      |
|---------------------|---|---|-------------------------|------------------------|
| MCL2012-A<br>[0805] | 2.0 (+0.3, -0.1)<br>[.079 (+.012, -.004)] | 1.25±0.2<br>[.049±.008]                 | 0.85±0.2<br>[.033±.008] | 0.5±0.3<br>[.020±.012] |
| MCL2016-A<br>[0806] | 2.0 (+0.3, -0.1)<br>[.079 (+.012, -.004)] | 1.6±0.2<br>[.063±.008]                  | 0.9±0.1<br>[.035±.004]  | 0.5±0.3<br>[.020±.012] |
| MCL2520-A<br>[1008] | 2.5±0.2<br>[.098±.008]                    | 2.0(+0.3, -0.1)<br>[.079(+.012, -.004)] | 0.9±0.1<br>[.035±.004]  | 0.5±0.3<br>[.020±.012] |

## SPECIFICATIONS

### MCL2012A TYPE

| Part Number   | Inductance | L Test Freq. | DC Resistance |       | Min. Self-resonant Frequency | Saturation Current Typ. | Heat Rating Current Max. |
|---------------|------------|--------------|---------------|-------|------------------------------|-------------------------|--------------------------|
| Units         | μH         | MHz          | Ω             |       | MHz                          | A                       | A                        |
| Symbol        | L          | Freq.        | DCR           |       | S.R.F                        | Isat                    | Irms                     |
|               |            |              | Max.          | Typ.  |                              |                         |                          |
| MCL2012A1R0MT | 1.0        | 1            | 0.150         | 0.120 | 120                          | 0.45                    | 1.45                     |
| MCL2012A1R5MT | 1.5        | 1            | 0.187         | 0.150 | 90                           | 0.35                    | 1.35                     |
| MCL2012A2R2MT | 2.2        | 1            | 0.225         | 0.180 | 70                           | 0.30                    | 1.30                     |
| MCL2012A3R3MT | 3.3        | 1            | 0.312         | 0.250 | 55                           | 0.21                    | 0.90                     |
| MCL2012A4R7MT | 4.7        | 1            | 0.375         | 0.300 | 50                           | 0.18                    | 0.85                     |
| MCL2012A100MT | 10         | 1            | 0.500         | 0.400 | 35                           | 0.15                    | 0.40                     |

### MCL2016A TYPE

| Part Number   | Inductance | L Test Freq. | DC Resistance |       | Min. Self-resonant Frequency | Saturation Current Typ. | Heat Rating Current Max. |
|---------------|------------|--------------|---------------|-------|------------------------------|-------------------------|--------------------------|
| Units         | μH         | MHz          | Ω             |       | MHz                          | A                       | A                        |
| Symbol        | L          | Freq.        | DCR           |       | S.R.F                        | Isat                    | Irms                     |
|               |            |              | Max.          | Typ.  |                              |                         |                          |
| MCL2016A1R0MT | 1.0        | 1            | 0.175         | 0.140 | 120                          | 0.90                    | 1.10                     |
| MCL2016A1R5MT | 1.5        | 1            | 0.200         | 0.160 | 100                          | 0.55                    | 1.00                     |
| MCL2016A2R2MT | 2.2        | 1            | 0.275         | 0.220 | 70                           | 0.60                    | 0.85                     |
| MCL2016A4R7MT | 4.7        | 1            | 0.200         | 0.160 | 50                           | 0.10                    | 1.20                     |

### MCL2520A TYPE

| Part Number   | Inductance | L Test Freq. | DC Resistance |       | Min. Self-resonant Frequency | Saturation Current Typ. | Heat Rating Current Max. |
|---------------|------------|--------------|---------------|-------|------------------------------|-------------------------|--------------------------|
| Units         | μH         | MHz          | Ω             |       | MHz                          | A                       | A                        |
| Symbol        | L          | Freq.        | DCR           |       | S.R.F                        | Isat                    | Irms                     |
|               |            |              | Max.          | Typ.  |                              |                         |                          |
| MCL2520A1R0MT | 1.0        | 1            | 0.100         | 0.080 | 100                          | 0.75                    | 1.15                     |
| MCL2520A1R5MT | 1.5        | 1            | 0.137         | 0.110 | 85                           | 0.60                    | 1.00                     |
| MCL2520A2R2MT | 2.2        | 1            | 0.162         | 0.130 | 70                           | 0.50                    | 1.40                     |
| MCL2520A4R7MT | 4.7        | 1            | 0.350         | 0.280 | 45                           | 0.25                    | 0.95                     |

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

※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  $20^{\circ}\text{C}$  ambient.

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