

# Inductors for Power Circuits

Multilayer Ferrite

## MLP<sub>series</sub>

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|         |                   |
|---------|-------------------|
| MLP1005 | 1005 [0402 inch]* |
| MLP1608 | 1608 [0603 inch]  |
| MLP2012 | 2012 [0805 inch]  |
| MLP2016 | 2016 [0806 inch]  |
| MLP2520 | 2520 [1008 inch]  |

\* Dimensions Code JIS[EIA]

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## REMINDERS FOR USING THESE PRODUCTS

Before using these products, be sure to request the delivery specifications.

### SAFETY REMINDERS

Please pay sufficient attention to the warnings for safe designing when using these products.

#### REMINDERS

- The storage period is less than 12 months. Be sure to follow the storage conditions (Temperature: 5 to 40°C, Humidity: 10 to 75% RH or less).  
If the storage period elapses, the soldering of the terminal electrodes may deteriorate.
- Do not use or store in locations where there are conditions such as gas corrosion (salt, acid, alkali, etc.).
- Before soldering, be sure to preheat components.  
The preheating temperature should be set so that the temperature difference between the solder temperature and chip temperature does not exceed 150°C.
- Soldering corrections after mounting should be within the range of the conditions determined in the specifications.  
If overheated, a short circuit, performance deterioration, or lifespan shortening may occur.
- When embedding a printed circuit board where a chip is mounted to a set, be sure that residual stress is not given to the chip due to the overall distortion of the printed circuit board and partial distortion such as at screw tightening portions.
- Self heating (temperature increase) occurs when the power is turned ON, so the tolerance should be sufficient for the set thermal design.
- Carefully lay out the coil for the circuit board design of the non-magnetic shield type.  
A malfunction may occur due to magnetic interference.
- Use a wrist band to discharge static electricity in your body through the grounding wire.
- Do not expose the products to magnets or magnetic fields.
- Do not use for a purpose outside of the contents regulated in the delivery specifications.
- The products listed on this catalog are intended for use in general electronic equipment (AV equipment, telecommunications equipment, home appliances, amusement equipment, computer equipment, personal equipment, office equipment, measurement equipment, industrial robots) under a normal operation and use condition.  
The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality require a more stringent level of safety or reliability, or whose failure, malfunction or trouble could cause serious damage to society, person or property.  
If you intend to use the products in the applications listed below or if you have special requirements exceeding the range or conditions set forth in the each catalog, please contact us.

- (1) Aerospace/Aviation equipment
- (2) Transportation equipment (cars, electric trains, ships, etc.)
- (3) Medical equipment
- (4) Power-generation control equipment
- (5) Atomic energy-related equipment
- (6) Seabed equipment
- (7) Transportation control equipment

- (8) Public information-processing equipment
- (9) Military equipment
- (10) Electric heating apparatus, burning equipment
- (11) Disaster prevention/crime prevention equipment
- (12) Safety equipment
- (13) Other applications that are not considered general-purpose applications

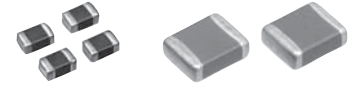
When designing your equipment even for general-purpose applications, you are kindly requested to take into consideration securing protection circuit/device or providing backup circuits in your equipment.

# Inductors for Power Circuits

## Multilayer Ferrite

Product compatible with RoHS directive  
Halogen-free  
Compatible with lead-free solders

# Overview of the MLP Series



## FEATURES

- A low-loss magnetic material is used so that a low-loss inductor for the power supply circuit can be achieved.
- In addition to the inductance value, product types with various features are available so that they can be compatible with different usages.
  - K Type: Products with low DC resistance and large current.
  - H Type: This product uses a low-loss material and has low DC resistance.
    - \* Optimal for when heavy load power efficiency is important.
  - V Type: As with the H type, this product with a low-loss magnetic material and that has good DC superimposition type characteristics.
    - \* Optimal for when light load power efficiency is important.
  - S Type: STD product lineup that includes a wide L value and various sizes.
  - M Type: Product supporting high frequency applications, suitable for high-speed drive power circuits.

## APPLICATION

Smart phones, tablet terminals, digital cameras, video cameras, HDDs, power supply modules, etc.

## PART NUMBER CONSTRUCTION

| MLP         |                | 1608     |                     | V                                                  |            | R47 |           | B    |                 | T      |               | <div></div> | <div></div> | <div></div> |
|-------------|----------------|----------|---------------------|----------------------------------------------------|------------|-----|-----------|------|-----------------|--------|---------------|-------------|-------------|-------------|
| Series name | LxW Dimensions |          | Characteristic type |                                                    | Inductance |     | Height    |      | Packaging style |        | Internal code |             |             |             |
|             | (mm)           |          |                     |                                                    | (μH)       |     | (mm max.) |      |                 |        |               |             |             |             |
|             | 1005           | 1.0×0.5  | K                   | Large current, low resistance                      | 1R0        | 1.0 | T         | 0.55 | T               | Taping |               |             |             |             |
|             | 1608           | 1.6×0.8  | H                   | Low core loss (Emphasized DC resistance)           | 100        | 10  | D         | 0.75 |                 |        |               |             |             |             |
|             | 2012           | 2.0×1.25 |                     |                                                    | S1R0S      | 1.2 | B         | 0.95 |                 |        |               |             |             |             |
|             | 2016           | 2.0×1.6  | V                   | Low core loss (Emphasized DC bias characteristics) | S2R2S      | 2.5 | M         | 1.0  |                 |        |               |             |             |             |
|             |                |          | S                   | STD product                                        |            |     | S         | 1.2  |                 |        |               |             |             |             |
|             |                |          | M                   | High frequency                                     |            |     |           |      |                 |        |               |             |             |             |

## OPERATING TEMPERATURE RANGE, PACKAGE QUANTITY, PRODUCT WEIGHT

| Type    |        | Temperature range      |                       | Package quantity<br>(pieces/reel) | Individual weight<br>(mg) |
|---------|--------|------------------------|-----------------------|-----------------------------------|---------------------------|
|         |        | Operating temperature* | Storage temperature** |                                   |                           |
|         |        | (°C)                   | (°C)                  |                                   |                           |
| MLP1005 | t=0.75 | −40 to +125            | −40 to +85            | 8,000                             | 1.8                       |
| MLP1608 | t=0.75 | −40 to +125            | −40 to +85            | 4,000                             | 4                         |
|         | t=0.95 |                        |                       |                                   | 5.5                       |
| MLP2012 | t=0.55 | −40 to +125            | −40 to +85            | 4,000                             | 7                         |
|         | t=1.0  |                        |                       |                                   | 10                        |
| MLP2016 |        | −40 to +125            | −40 to +85            | 3,000                             | 12                        |
| MLP2520 | t=1.0  | −40 to +125            | −40 to +85            | 3,000                             | 15                        |
|         | t=1.2  |                        |                       |                                   | 25                        |

\* Operating temperature range includes self-temperature rise.

\*\* The Storage temperature range is for after the circuit board is mounted.

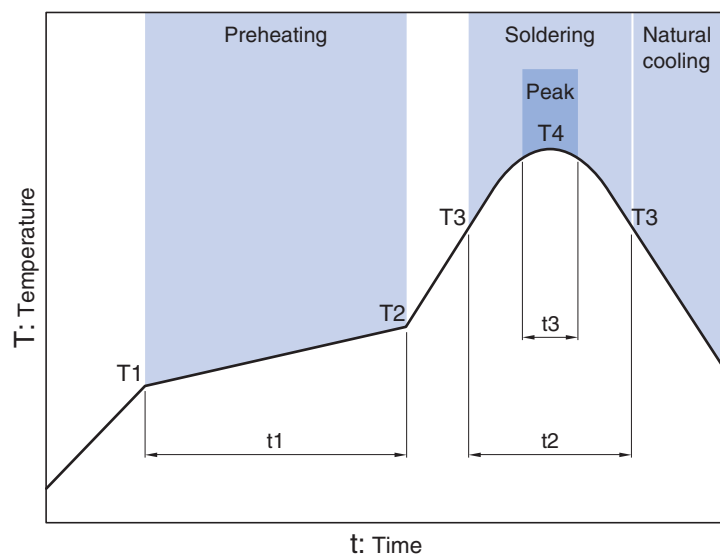
○ RoHS Directive Compliant Product: See the following for more details related to RoHS Directive compliant products. <http://www.tdk.co.jp/rohs/>

○ Halogen-free: Indicates that Cl content is less than 900ppm, Br content is less than 900ppm, and that the total Cl and Br content is less than 1500ppm.

• All specifications are subject to change without notice.

# Overview of the MLP Series

## RECOMMENDED REFLOW PROFILE

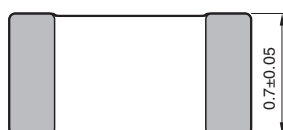
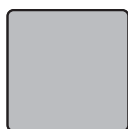
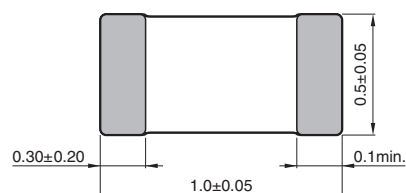


| Preheating |       |            | Soldering |           | Peak         |          |
|------------|-------|------------|-----------|-----------|--------------|----------|
| Temp.      | Temp. | Time       | Temp.     | Time      | Temp.        | Time     |
| T1         | T2    | t1         | T3        | t2        | T4           | t3       |
| 150°C      | 180°C | 60 to 120s | 230°C     | 30 to 60s | 250 to 260°C | 10s max. |

MLP<sub>series</sub>

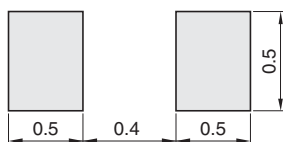
# MLP1005 Type

## ■ SHAPE & DIMENSIONS



Dimensions in mm

## ■ RECOMMENDED LAND PATTERN



Dimensions in mm

MLP<sub>series</sub> **MLP1005 Type**

## ■ ELECTRICAL CHARACTERISTICS

## □ CHARACTERISTICS SPECIFICATION TABLE

| Type           | Thickness T<br>(mm) | L    |           | Measuring<br>frequency<br>(MHz) | DC resistance<br>(Ω)±30% | Rated current*<br>(mA) | Part No.**       |
|----------------|---------------------|------|-----------|---------------------------------|--------------------------|------------------------|------------------|
|                | max.                | (μH) | tolerance |                                 |                          | max.                   |                  |
| High frequency | 0.75                | 1.0  | ±20%      | 10                              | 0.53                     | 500                    | MLP1005M1R0DT□□□ |

\* Rated current: Current assumed when temperature has risen to 40°C max.

\*\* □□□: Please specify internal code.

## ○ Measurement equipment

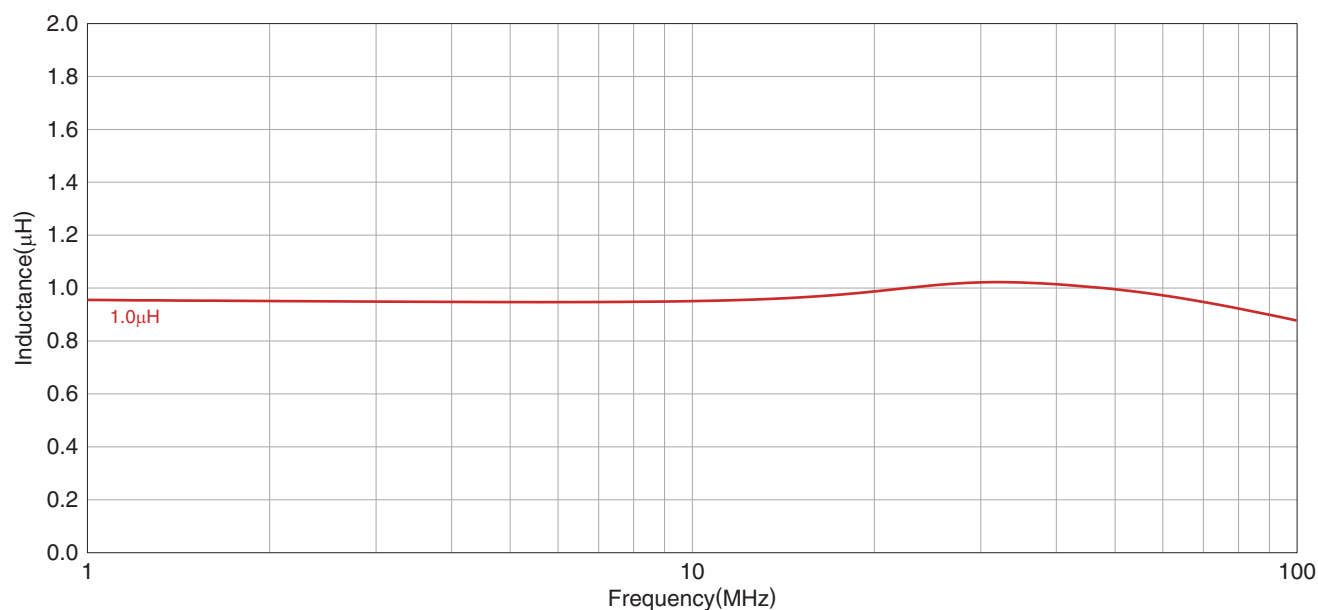
| Measurement item | Product No.  | Manufacturer         |
|------------------|--------------|----------------------|
| L                | 4294A+16034G | Agilent Technologies |
| DC resistance    | Type-7561    | Yokogawa             |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP1005Type** (M characteristic product, T dimension of the product 0.75mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

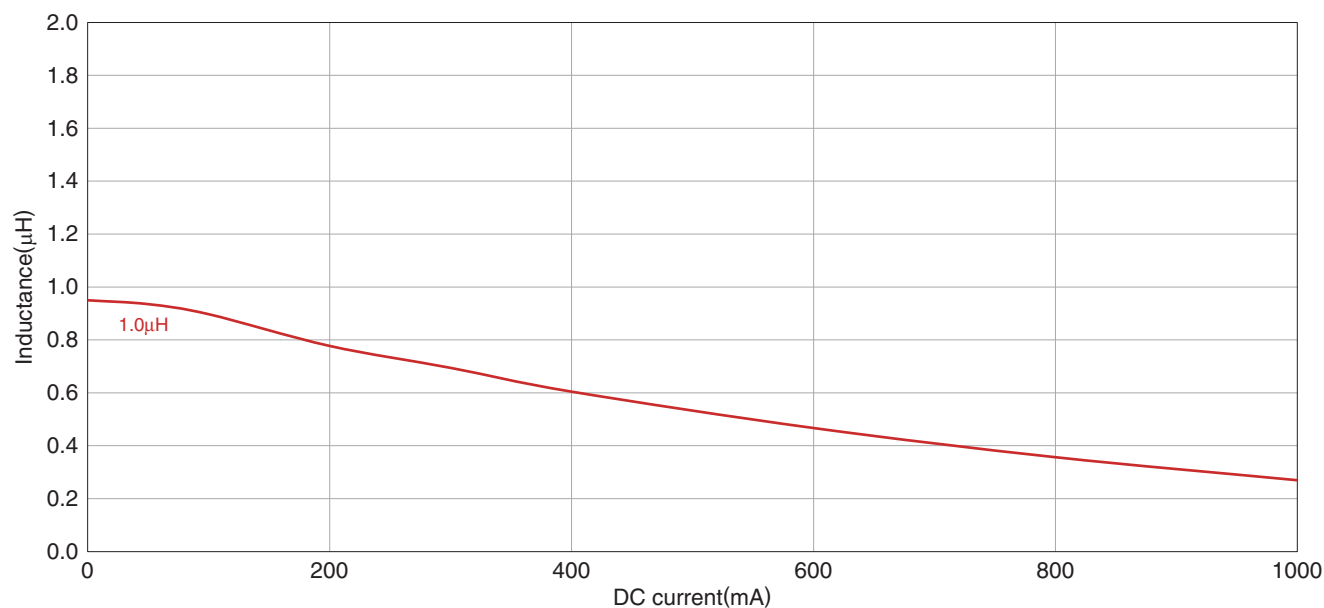
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP1005 Type** (M characteristic product, T dimension of the product 0.75mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH



○ Measurement equipment

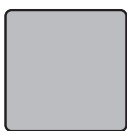
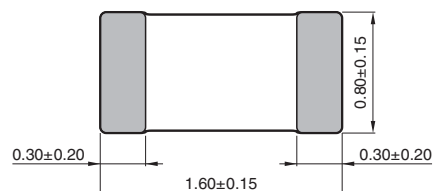
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

MLP<sub>series</sub>

## MLP1608 Type

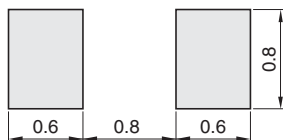
## ■ SHAPE &amp; DIMENSIONS



| T         |
|-----------|
| 0.60±0.15 |
| 0.80±0.15 |

Dimensions in mm

## ■ RECOMMENDED LAND PATTERN



Dimensions in mm

MLP<sub>series</sub> **MLP1608 Type**

## ■ ELECTRICAL CHARACTERISTICS

## □ CHARACTERISTICS SPECIFICATION TABLE

| Type          |                                          | Thickness T<br>(mm) | L    |           | Measuring<br>frequency<br>(MHz) | DC resistance<br>(Ω)±30% | Rated current*<br>(mA) | Part No.**       |
|---------------|------------------------------------------|---------------------|------|-----------|---------------------------------|--------------------------|------------------------|------------------|
|               |                                          | max.                | (μH) | tolerance |                                 |                          |                        |                  |
| Low core loss | Low resistance                           | 0.95                | 2.2  | ±20%      | 2                               | 0.30                     | 750                    | MLP1608H2R2BT□□□ |
|               |                                          | 0.75                | 0.47 | ±20%      | 2                               | 0.22                     | 800                    | MLP1608VR47DT□□□ |
|               | Emphasized<br>DC bias<br>characteristics | 0.75                | 1.0  | ±20%      | 2                               | 0.30                     | 700                    | MLP1608V1R0DT□□□ |
|               |                                          | 0.95                | 0.47 | ±20%      | 2                               | 0.20                     | 800                    | MLP1608VR47BT□□□ |
|               |                                          | 0.95                | 1.0  | ±20%      | 2                               | 0.30                     | 700                    | MLP1608V1R0BT□□□ |
|               |                                          | 0.95                | 2.2  | ±20%      | 2                               | 0.36                     | 600                    | MLP1608V2R2BT□□□ |

\* Rated current: Current assumed when temperature has risen to 40°C max.

\*\* □□□: Please specify internal code.

## ○ Measurement equipment

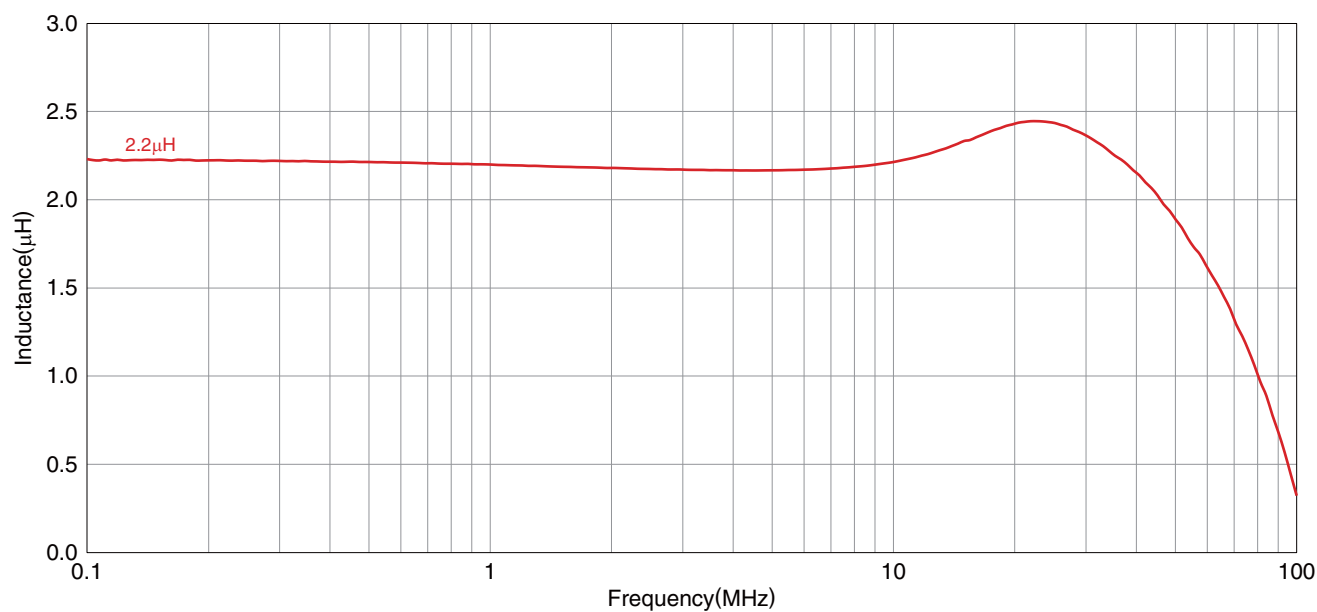
| Measurement item | Product No.  | Manufacturer         |
|------------------|--------------|----------------------|
| L                | 4294A+16034G | Agilent Technologies |
| DC resistance    | Type-7561    | Yokogawa             |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP1608Type** (H characteristic product, T dimension of the product 0.95mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

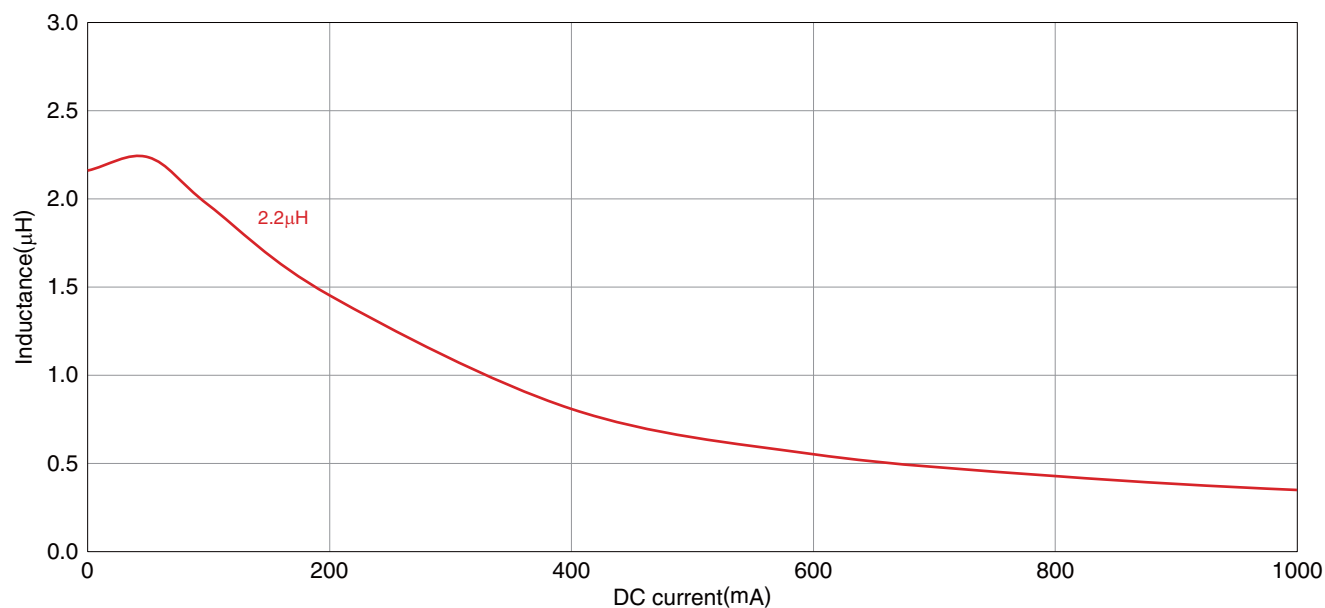
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP1608 Type** (H characteristic product, T dimension of the product 0.95mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH



○ Measurement equipment

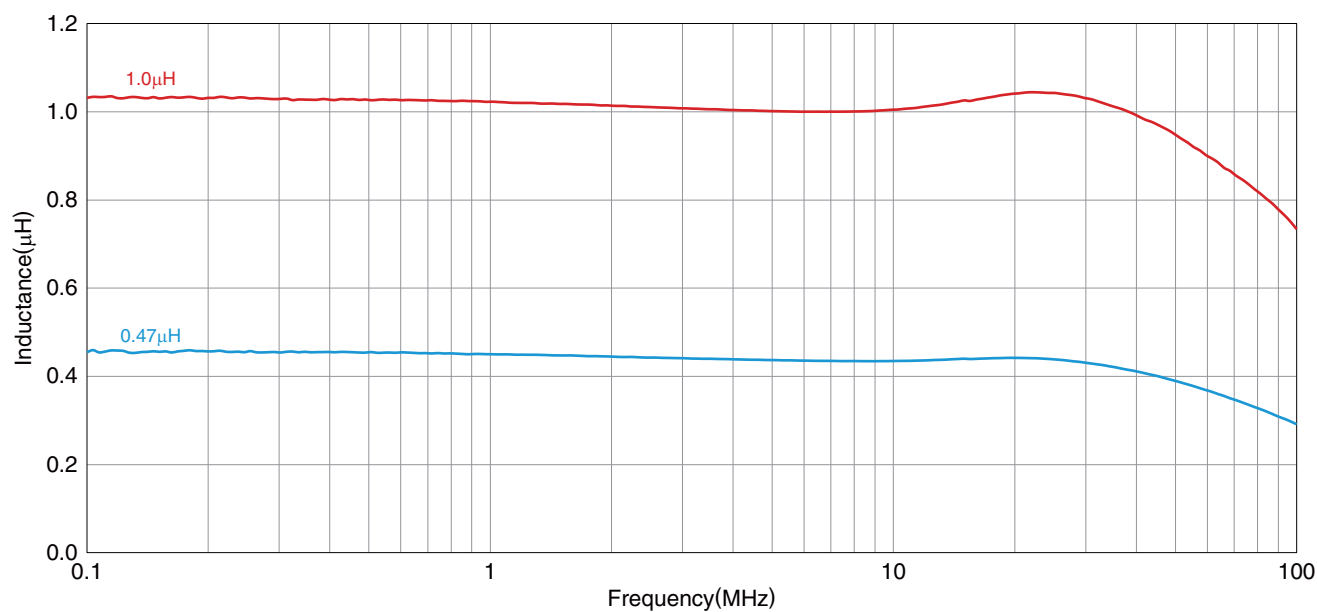
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP1608 Type** (V characteristic product, T dimension of the product 0.75mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

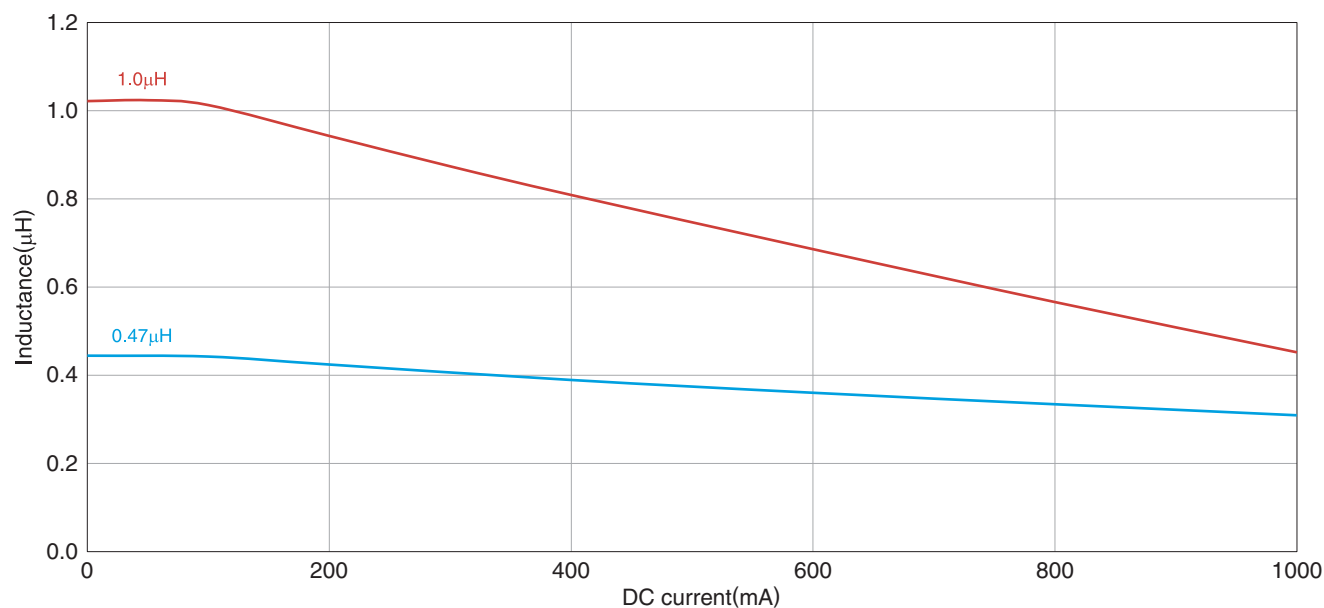
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP1608 Type** (V characteristic product, T dimension of the product 0.75mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH



○ Measurement equipment

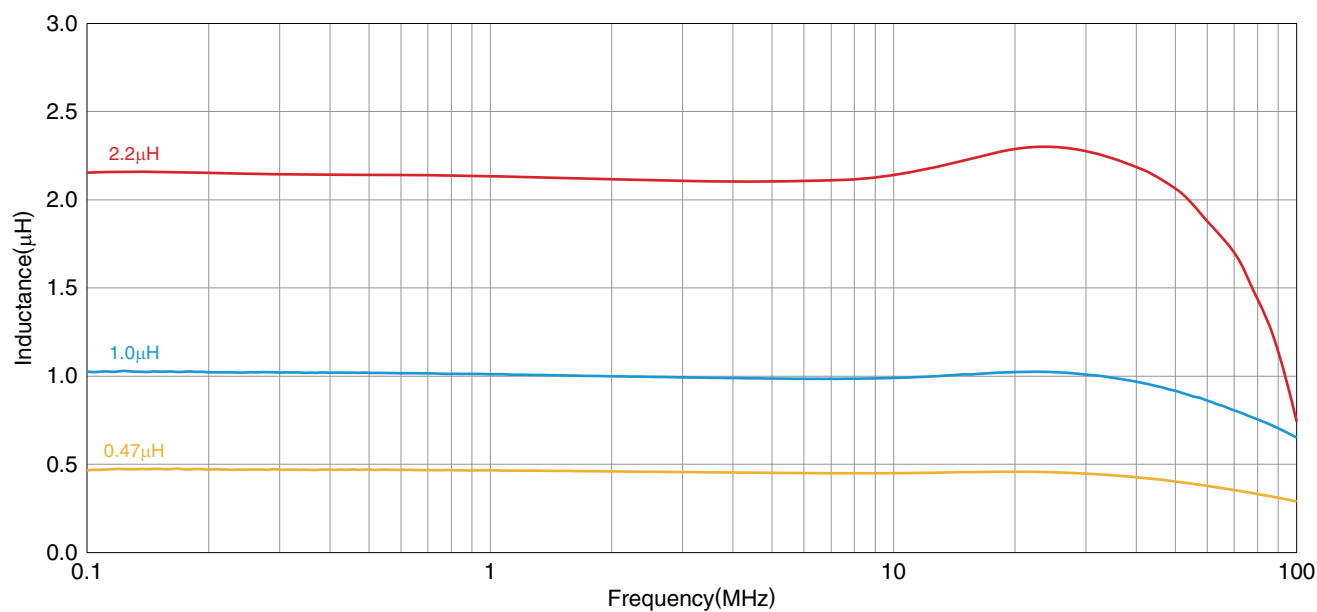
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP1608 Type** (V characteristic product, T dimension of the product 0.95mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

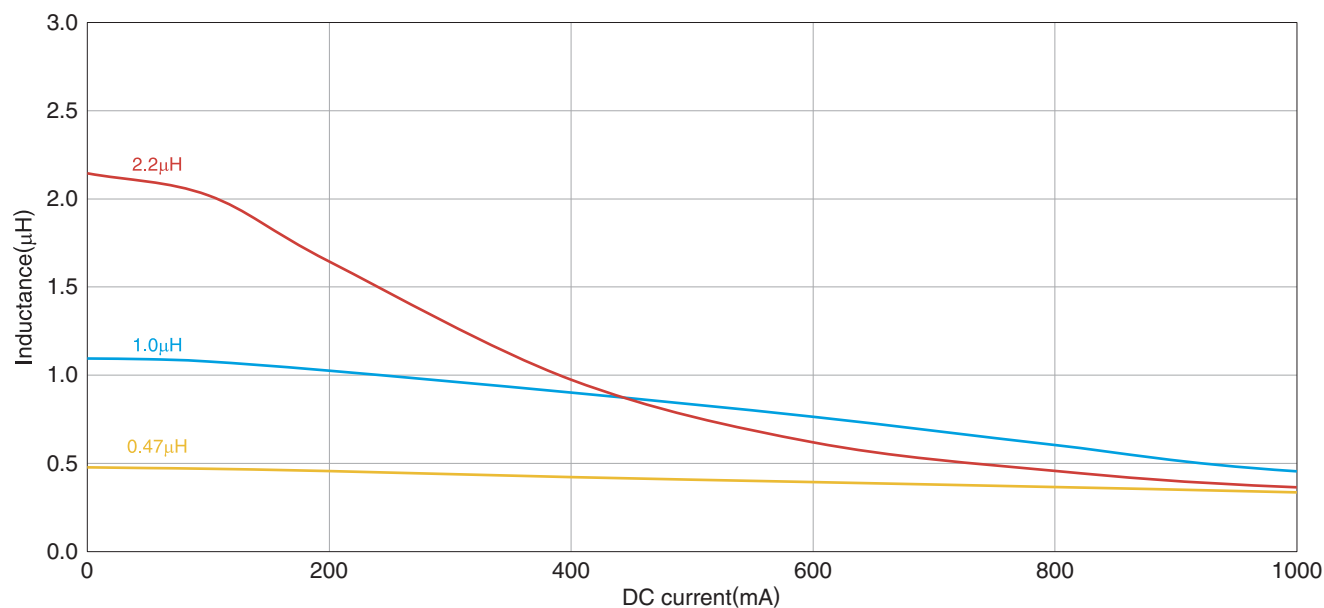
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP1608 Type** (V characteristic product, T dimension of the product 0.95mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH



○ Measurement equipment

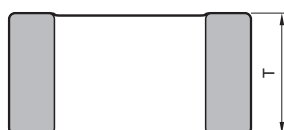
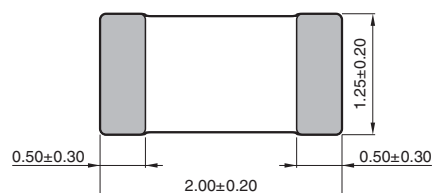
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

MLP<sub>series</sub>

# MLP2012 Type

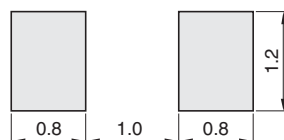
## ■ SHAPE & DIMENSIONS



| T               |
|-----------------|
| $0.50 \pm 0.05$ |
| $0.85 \pm 0.15$ |

Dimensions in mm

## ■ RECOMMENDED LAND PATTERN



Dimensions in mm

MLP<sub>series</sub> **MLP2012Type**

## ■ ELECTRICAL CHARACTERISTICS

## □ CHARACTERISTICS SPECIFICATION TABLE

| Type          | Thickness T<br>(mm)<br>max.              | L         |           | Measuring<br>frequency<br>(MHz) | DC resistance<br>(Ω)±30% | Rated current*<br>(mA)<br>max. | Part No.**       |
|---------------|------------------------------------------|-----------|-----------|---------------------------------|--------------------------|--------------------------------|------------------|
|               |                                          | (μH)      | tolerance |                                 |                          |                                |                  |
| Low core loss | Low resistance                           | 1.0       | 0.47 ±20% | 2                               | 0.07                     | 1300                           | MLP2012HR47MT□□□ |
|               |                                          | 1.0       | 0.54 ±20% | 2                               | 0.065                    | 1300                           | MLP2012HR54MT□□□ |
|               |                                          | 1.0       | 1.0 ±20%  | 2                               | 0.12                     | 1100                           | MLP2012H1R0MT□□□ |
|               |                                          | 1.0       | 1.5 ±20%  | 2                               | 0.12                     | 1100                           | MLP2012H1R5MT□□□ |
|               | Emphasized<br>DC bias<br>characteristics | 1.0       | 2.2 ±20%  | 2                               | 0.15                     | 1000                           | MLP2012H2R2MT□□□ |
|               |                                          | 0.55      | 1.0 ±20%  | 2                               | 0.26                     | 700                            | MLP2012V1R0TT□□□ |
|               |                                          | 1.0       | 0.47 ±20% | 2                               | 0.11                     | 1100                           | MLP2012VR47MT□□□ |
|               |                                          | 1.0       | 1.0 ±20%  | 2                               | 0.20                     | 900                            | MLP2012V1R0MT□□□ |
|               |                                          | 1.0       | 1.5 ±20%  | 2                               | 0.23                     | 800                            | MLP2012V1R5MT□□□ |
|               |                                          | 1.0       | 2.2 ±20%  | 2                               | 0.28                     | 700                            | MLP2012V2R2MT□□□ |
| STD product   | 1.0                                      | 4.7 ±20%  | 2         | 0.40                            | 600                      | MLP2012V4R7MT□□□               |                  |
|               | 0.55                                     | 0.47 ±20% | 2         | 0.13                            | 1200                     | MLP2012SR47TT□□□               |                  |
|               | 0.55                                     | 0.82 ±20% | 2         | 0.13                            | 1200                     | MLP2012SR82TT□□□               |                  |
|               | 0.55                                     | 1.0 ±20%  | 2         | 0.23                            | 800                      | MLP2012S1R0TT□□□               |                  |
|               | 0.55                                     | 1.5 ±20%  | 2         | 0.27                            | 700                      | MLP2012S1R5TT□□□               |                  |
|               | 0.55                                     | 2.2 ±20%  | 2         | 0.33                            | 600                      | MLP2012S2R2TT□□□               |                  |
|               | 1.0                                      | 0.47 ±20% | 2         | 0.09                            | 1200                     | MLP2012SR47MT□□□               |                  |
|               | 1.0                                      | 1.0 ±20%  | 2         | 0.16                            | 1000                     | MLP2012S1R0MT□□□               |                  |
|               | 1.0                                      | 1.5 ±20%  | 2         | 0.16                            | 1000                     | MLP2012S1R5MT□□□               |                  |
|               | 1.0                                      | 2.2 ±20%  | 2         | 0.23                            | 800                      | MLP2012S2R2MT□□□               |                  |
| 1.0           | 3.3 ±20%                                 | 2         | 0.19      | 900                             | MLP2012S3R3MT□□□         |                                |                  |
| 1.0           | 4.7 ±20%                                 | 2         | 0.26      | 700                             | MLP2012S4R7MT□□□         |                                |                  |

\* Rated current: Current assumed when temperature has risen to 40°C max.

\*\* □□□: Please specify internal code.

## ○ Measurement equipment

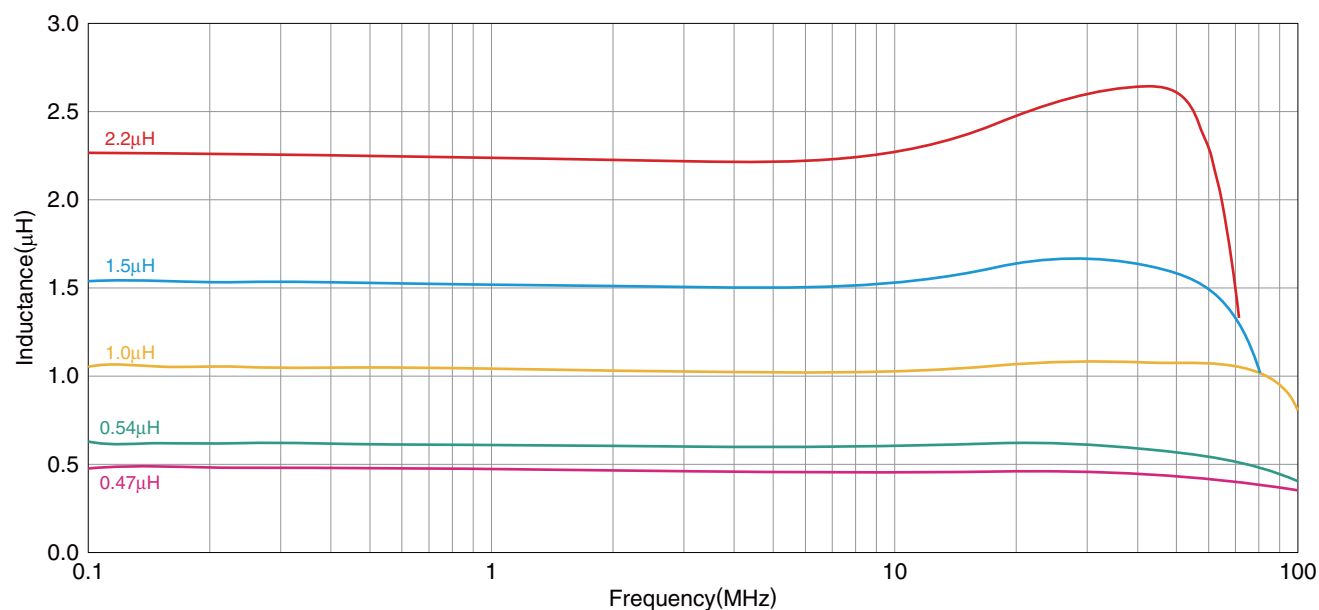
| Measurement item | Product No.  | Manufacturer         |
|------------------|--------------|----------------------|
| L                | 4294A+16034G | Agilent Technologies |
| DC resistance    | Type-7561    | Yokogawa             |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2012 Type** (H characteristic product, T dimension of the product 1.0mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

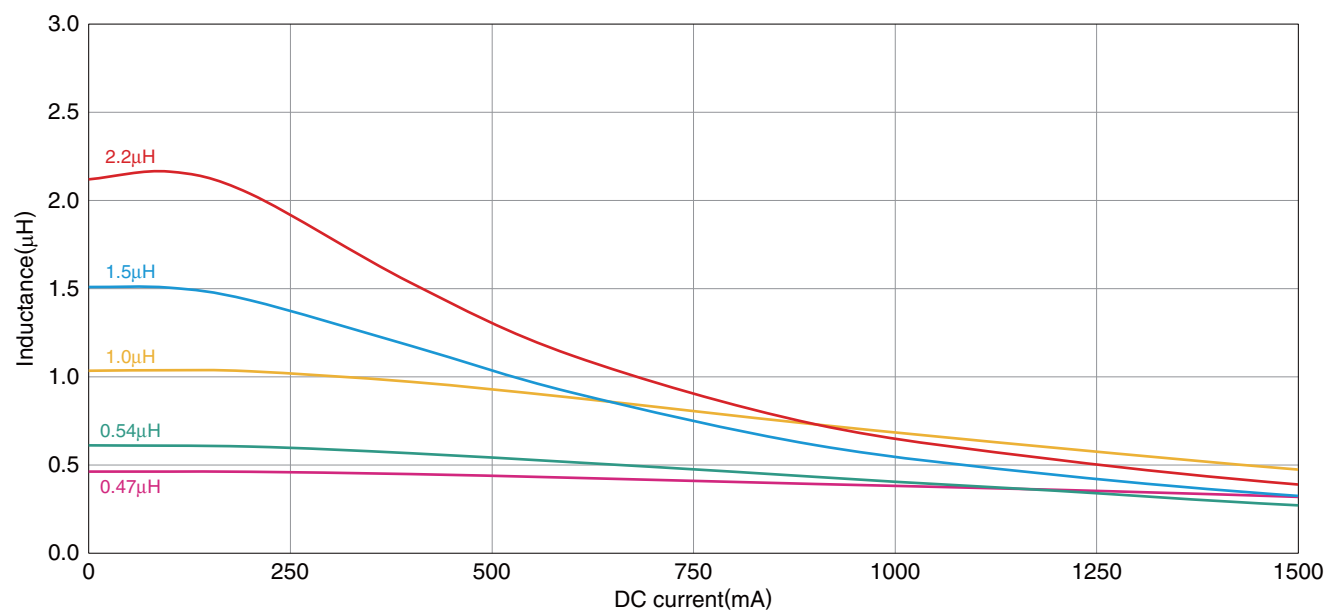
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2012 Type** (H characteristic product, T dimension of the product 1.0mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH



○ Measurement equipment

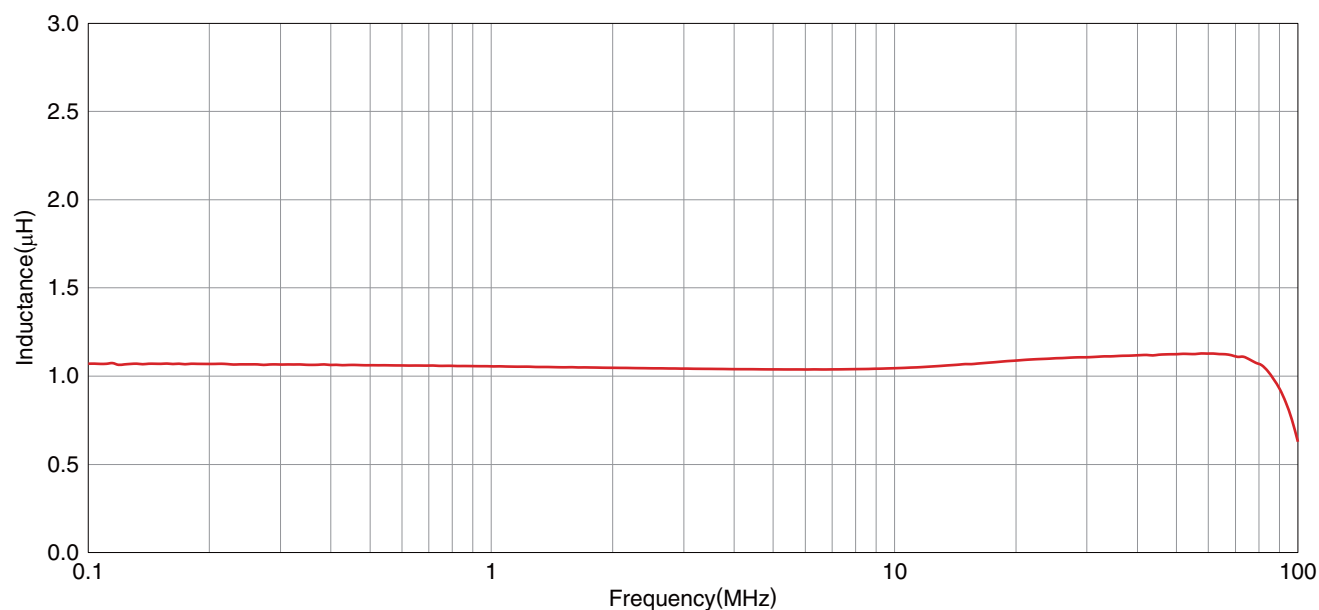
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2012 Type** (V characteristic product, T dimension of the product 0.55mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

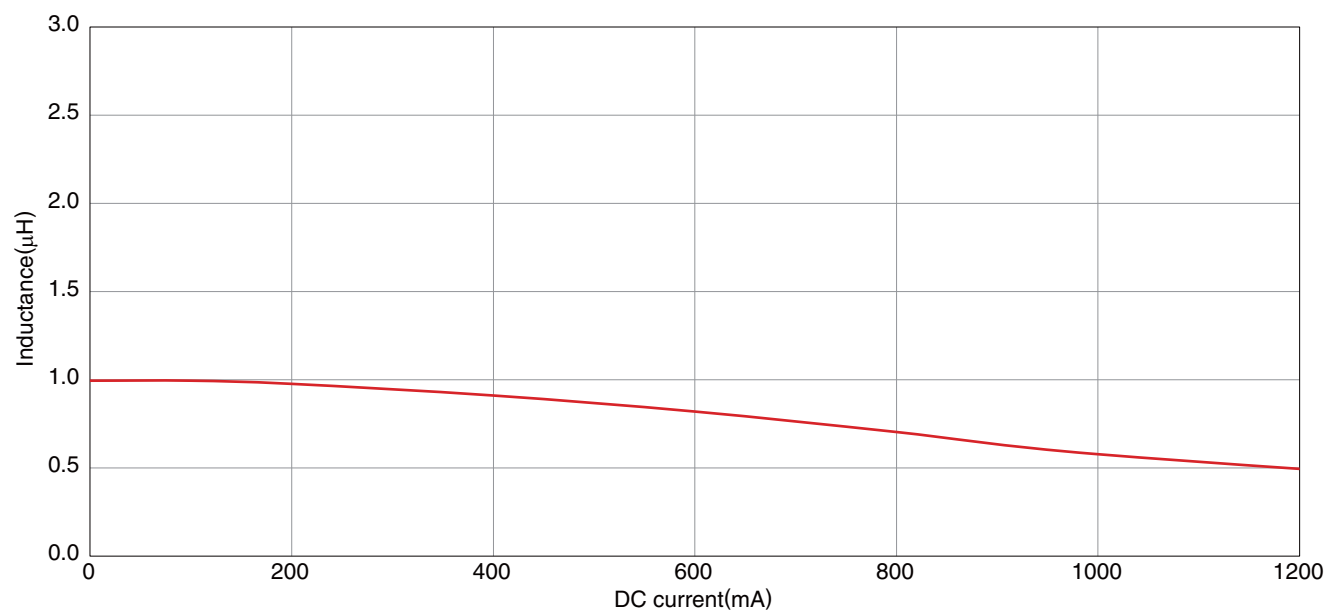
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2012 Type** (V characteristic product, T dimension of the product 0.55mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH



○ Measurement equipment

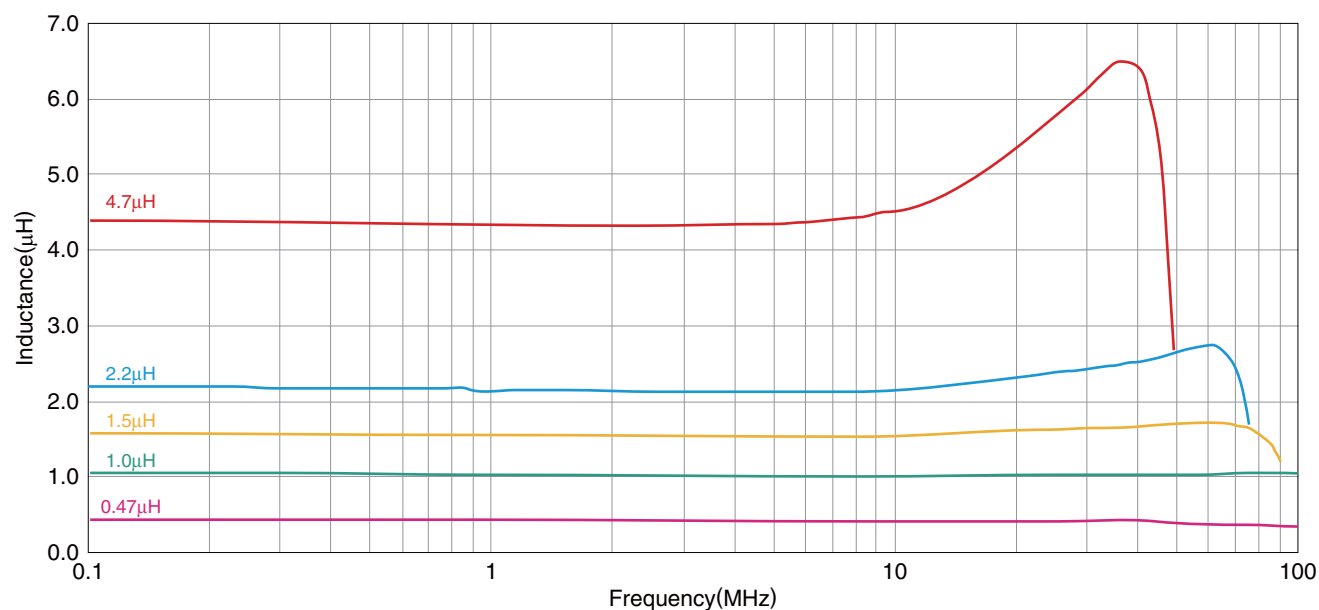
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2012 Type** (V characteristic product, T dimension of the product 1.0mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

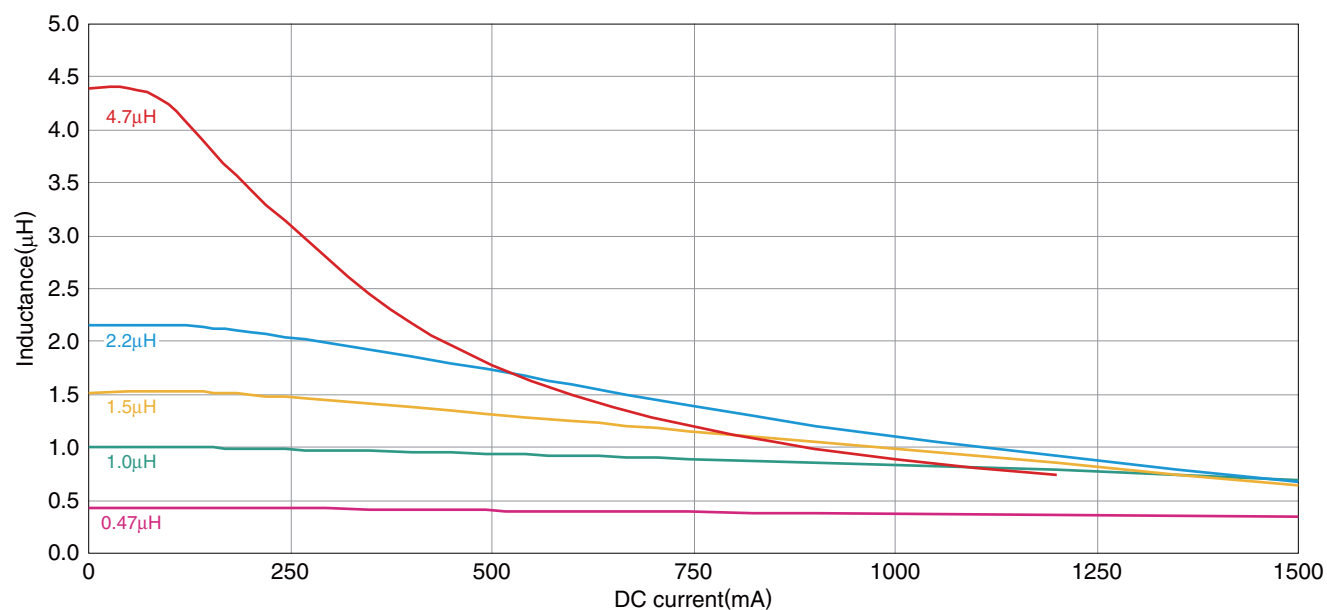
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2012 Type** (V characteristic product, T dimension of the product 1.0mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH



○ Measurement equipment

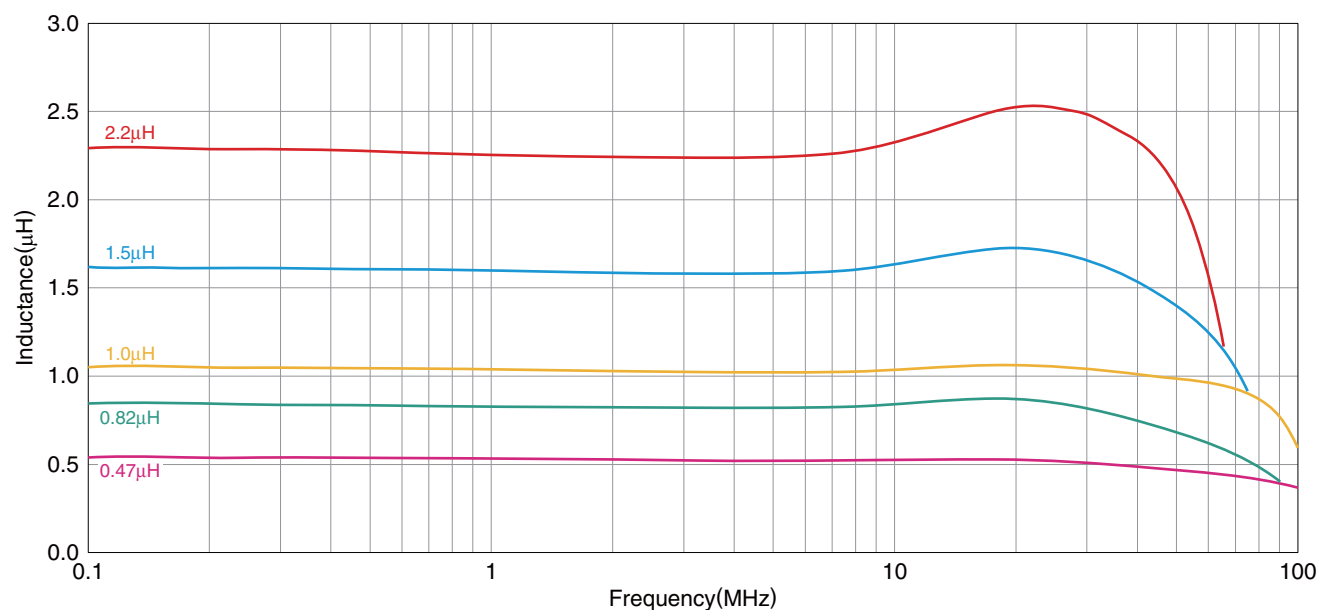
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2012 Type** (S characteristic product, T dimension of the product 0.55mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

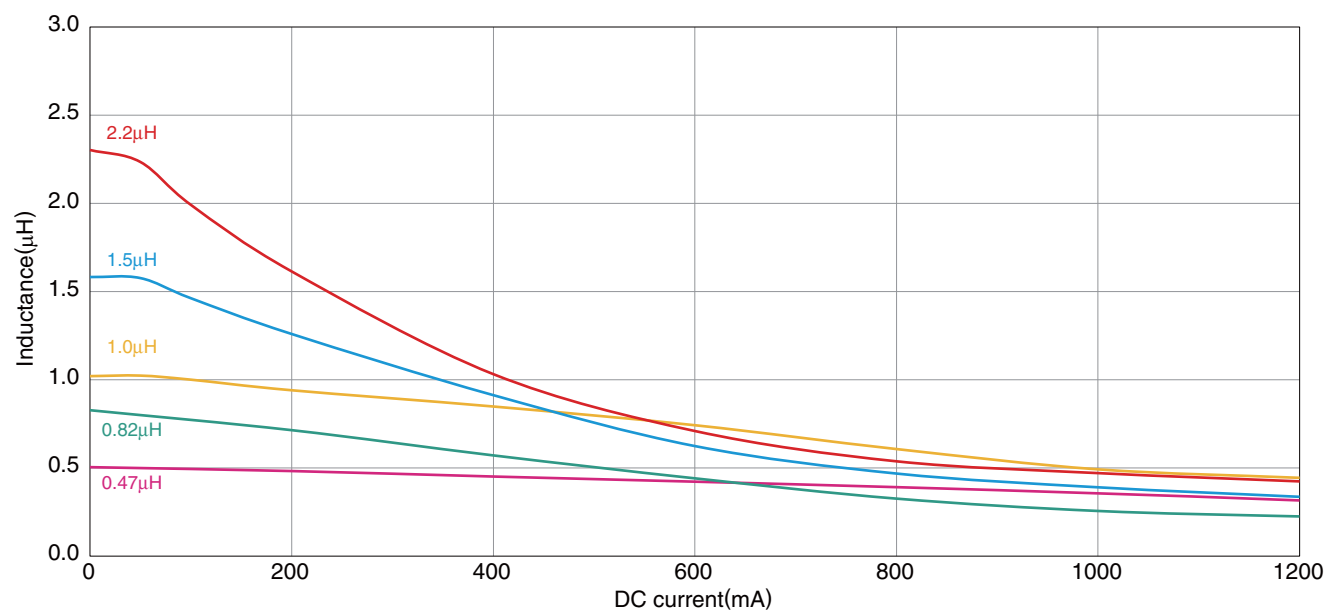
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2012 Type** (S characteristic product, T dimension of the product 0.55mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH



○ Measurement equipment

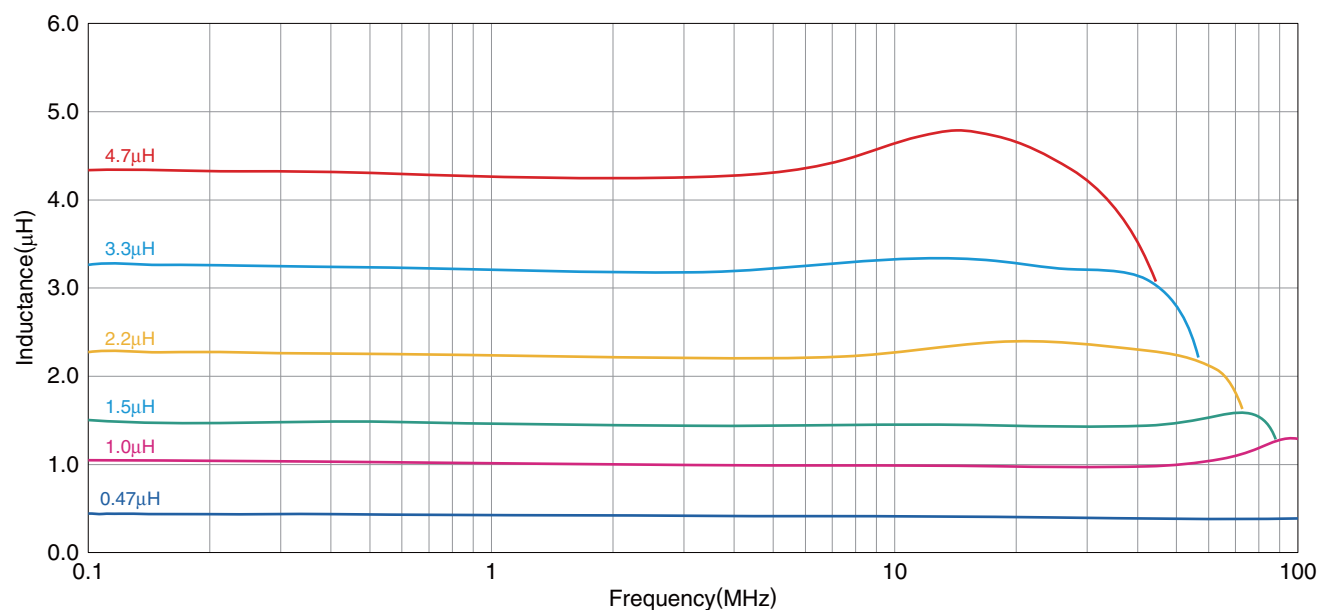
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2012 Type** (S characteristic product, T dimension of the product 1.0mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

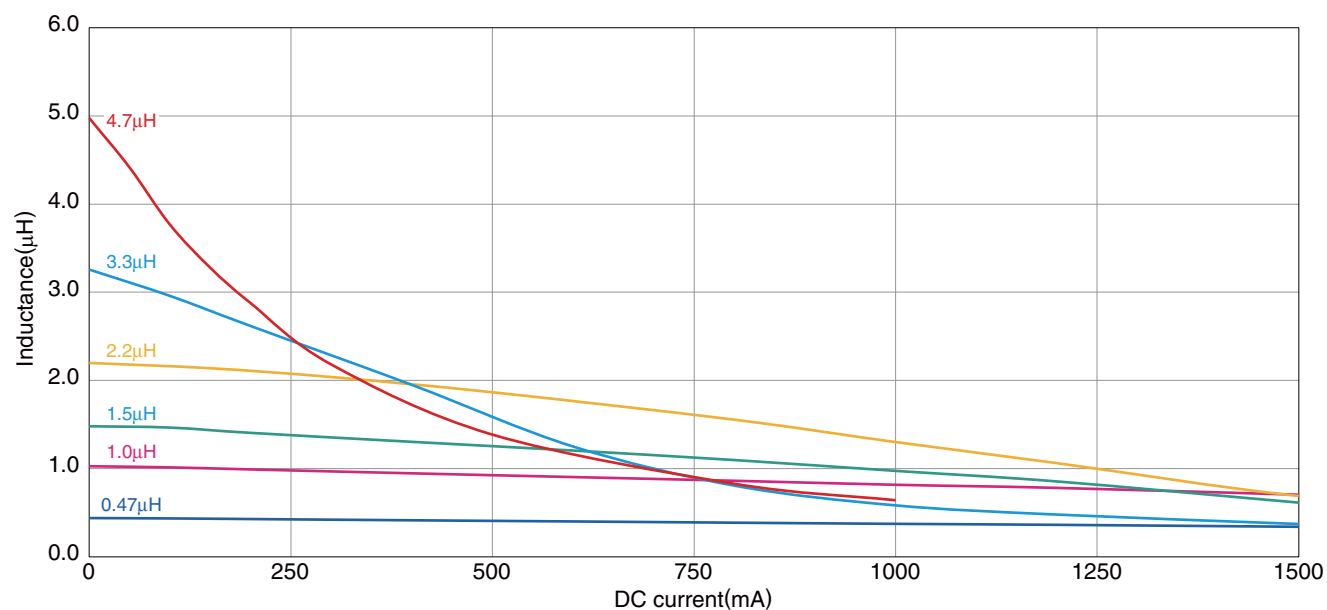
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2012 Type** (S characteristic product, T dimension of the product 1.0mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH



○ Measurement equipment

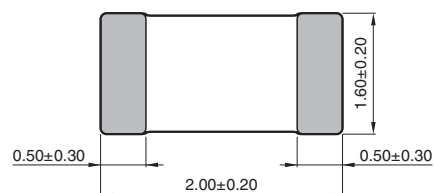
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

MLP<sub>series</sub>

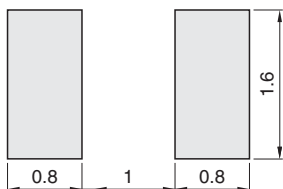
# MLP2016 Type

## ■ SHAPE & DIMENSIONS



Dimensions in mm

## ■ RECOMMENDED LAND PATTERN



Dimensions in mm

# MLP<sub>series</sub> MLP2016 Type

## ■ ELECTRICAL CHARACTERISTICS

### □ CHARACTERISTICS SPECIFICATION TABLE

| Type          | Thickness T<br>(mm) | L    |           | Measuring<br>frequency<br>(MHz) | DC resistance<br>(Ω) | Rated current* | Part No.**       |
|---------------|---------------------|------|-----------|---------------------------------|----------------------|----------------|------------------|
|               | max.                | (μH) | tolerance |                                 |                      | max.           |                  |
| Low core loss | 1.0                 | 0.47 | ±20%      | 2                               | 0.055±25%            | 1700           | MLP2016HR47MT□□□ |
|               | 1.0                 | 1.0  | ±20%      | 2                               | 0.09±25%             | 1300           | MLP2016H1R0MT□□□ |
|               | 1.0                 | 1.5  | ±20%      | 2                               | 0.11±25%             | 1200           | MLP2016H1R5MT□□□ |
|               |                     | 2.2  | ±20%      | 2                               | 0.11±25%             | 1200           | MLP2016H2R2MT□□□ |
|               | 1.0                 | 3.3  | ±20%      | 2                               | 0.12±25%             | 1200           | MLP2016H3R3MT□□□ |
|               | 1.0                 | 4.7  | ±20%      | 2                               | 0.16±25%             | 1100           | MLP2016H4R7MT□□□ |
|               | 1.0                 | 0.47 | ±20%      | 2                               | 0.07±25%             | 1500           | MLP2016VR47MT□□□ |
|               |                     | 1.0  | ±20%      | 2                               | 0.12±25%             | 1200           | MLP2016V1R0MT□□□ |
|               |                     | 1.5  | ±20%      | 2                               | 0.14±25%             | 1150           | MLP2016V1R5MT□□□ |
|               |                     | 2.2  | ±20%      | 2                               | 0.17±25%             | 1000           | MLP2016V2R2MT□□□ |
|               | 1.0                 | 0.47 | ±20%      | 2                               | 0.05±30%             | 1600           | MLP2016SR47MT□□□ |
|               | 1.0                 | 1.0  | ±20%      | 2                               | 0.09±30%             | 1400           | MLP2016S1R0MT□□□ |
| STD product   | 1.0                 | 1.5  | ±20%      | 2                               | 0.09±30%             | 1200           | MLP2016S1R5MT□□□ |
|               | 1.0                 | 2.2  | ±20%      | 2                               | 0.11±30%             | 1200           | MLP2016S2R2MT□□□ |
|               | 1.0                 | 4.7  | ±20%      | 2                               | 0.27±30%             | 800            | MLP2016S4R7MT□□□ |

\* Rated current: Current assumed when temperature has risen to 40°C max.

\*\* □□□: Please specify internal code.

#### ○ Measurement equipment

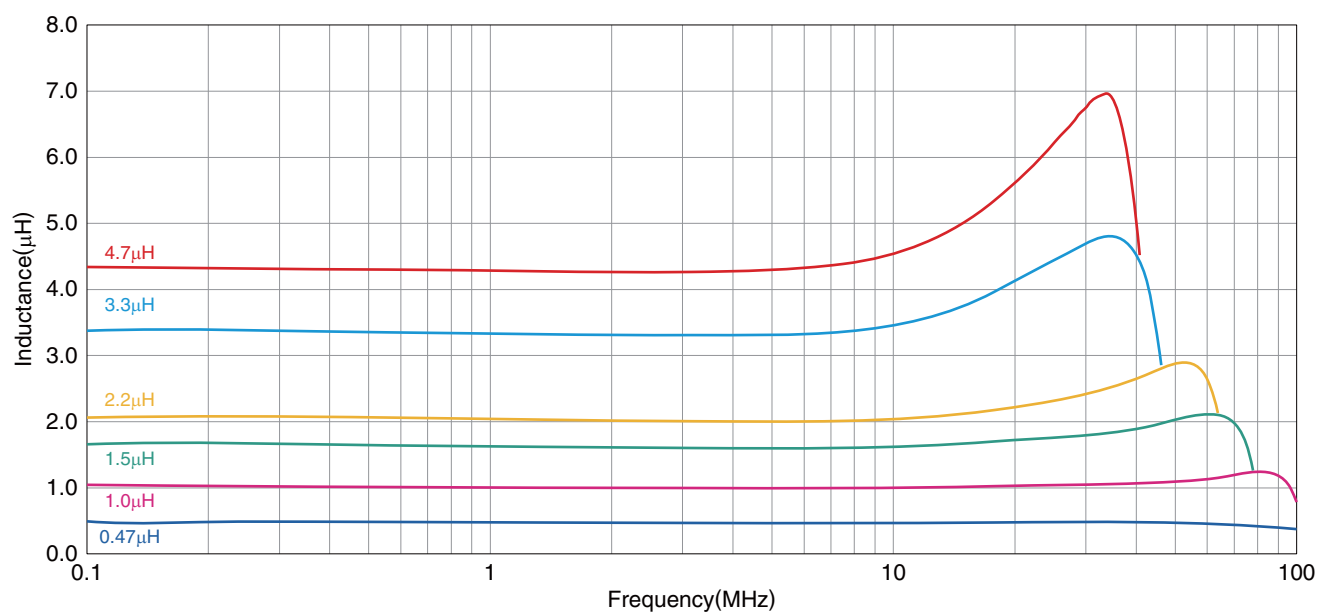
| Measurement item | Product No.  | Manufacturer         |
|------------------|--------------|----------------------|
| L                | 4294A+16034G | Agilent Technologies |
| DC resistance    | Type-7561    | Yokogawa             |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2016 Type** (H characteristic product, T dimension of the product 1.0mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

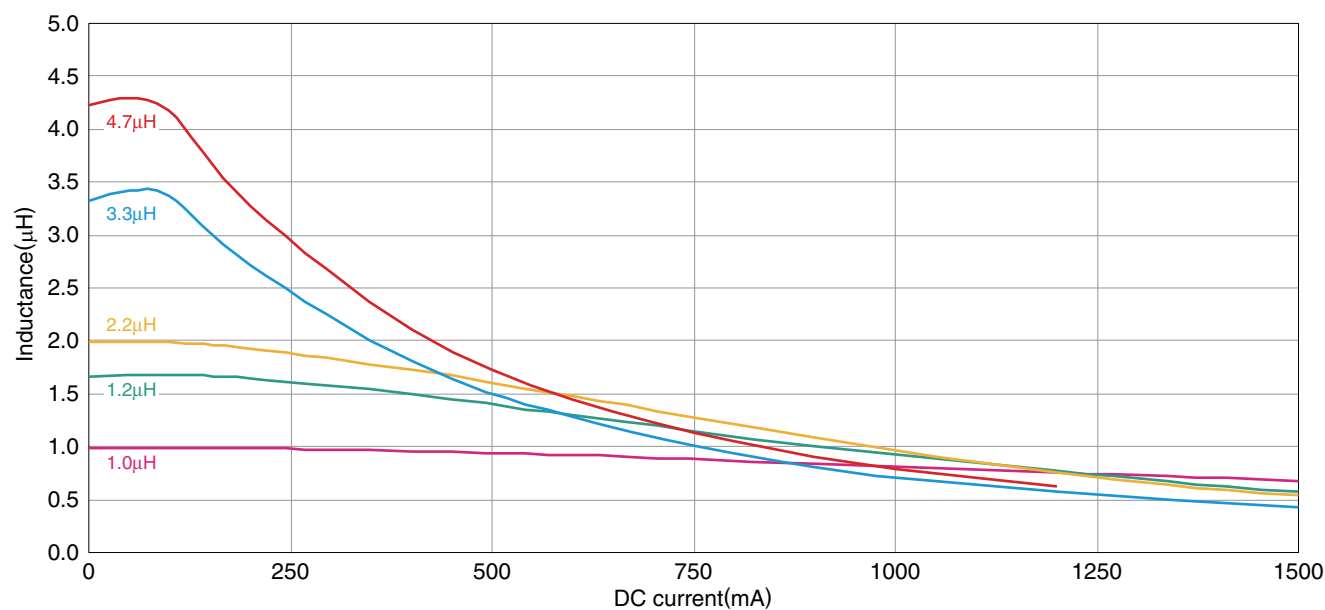
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2016 Type** (H characteristic product, T dimension of the product 1.0mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH (EXAMPLE)



○ Measurement equipment

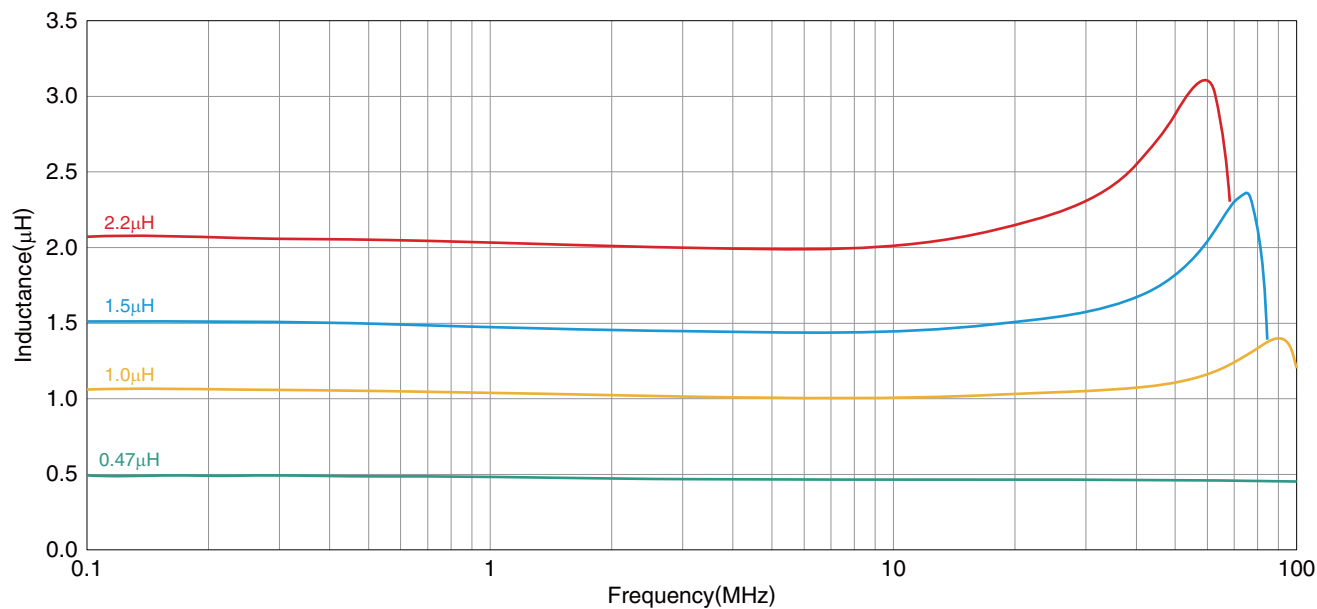
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2016 Type** (V characteristic product, T dimension of the product 1.0mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

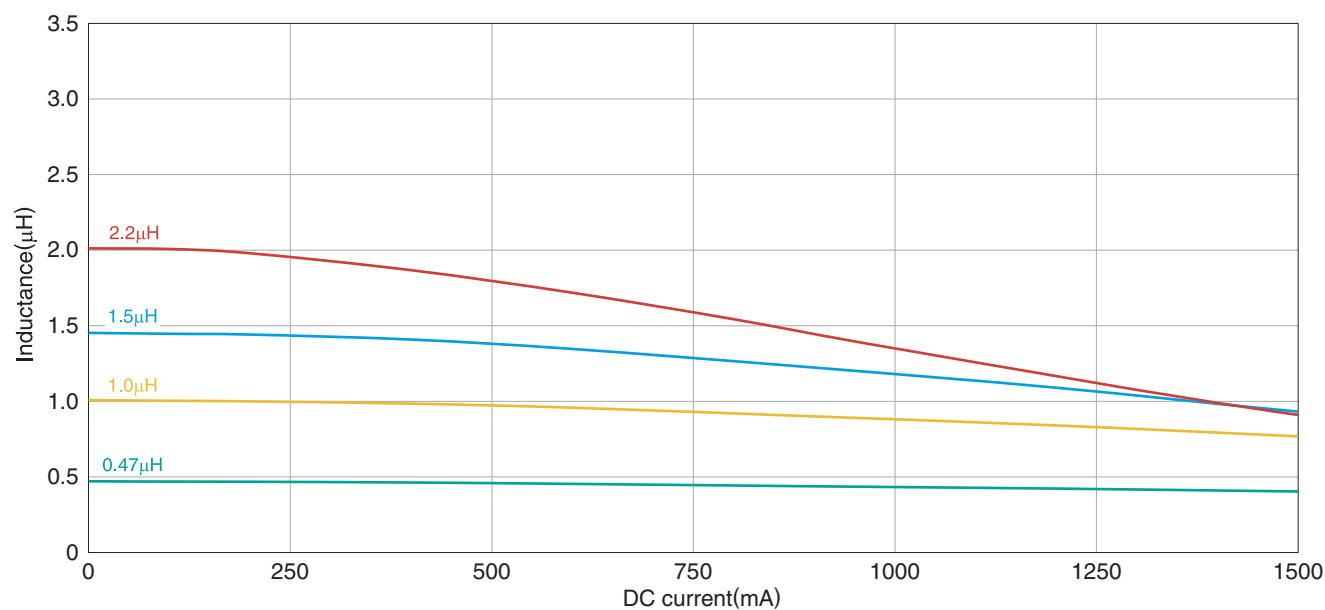
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2016 Type** (V characteristic product, T dimension of the product 1.0mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH



○ Measurement equipment

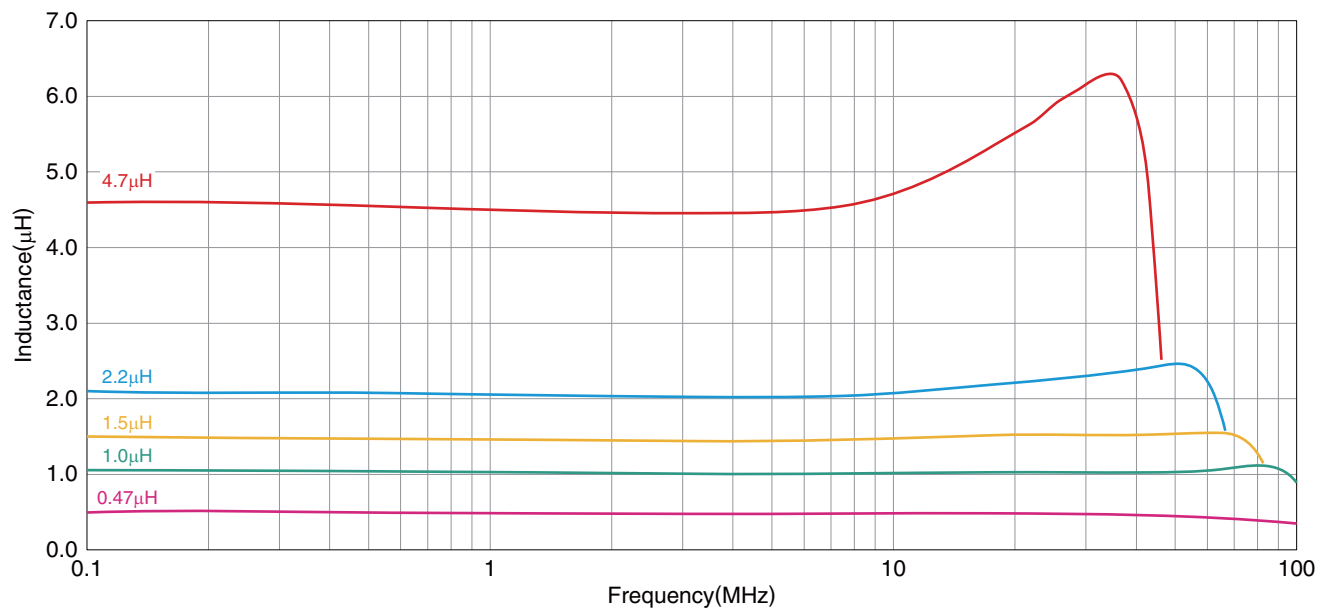
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2016 Type** (S characteristic product, T dimension of the product 1.0mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

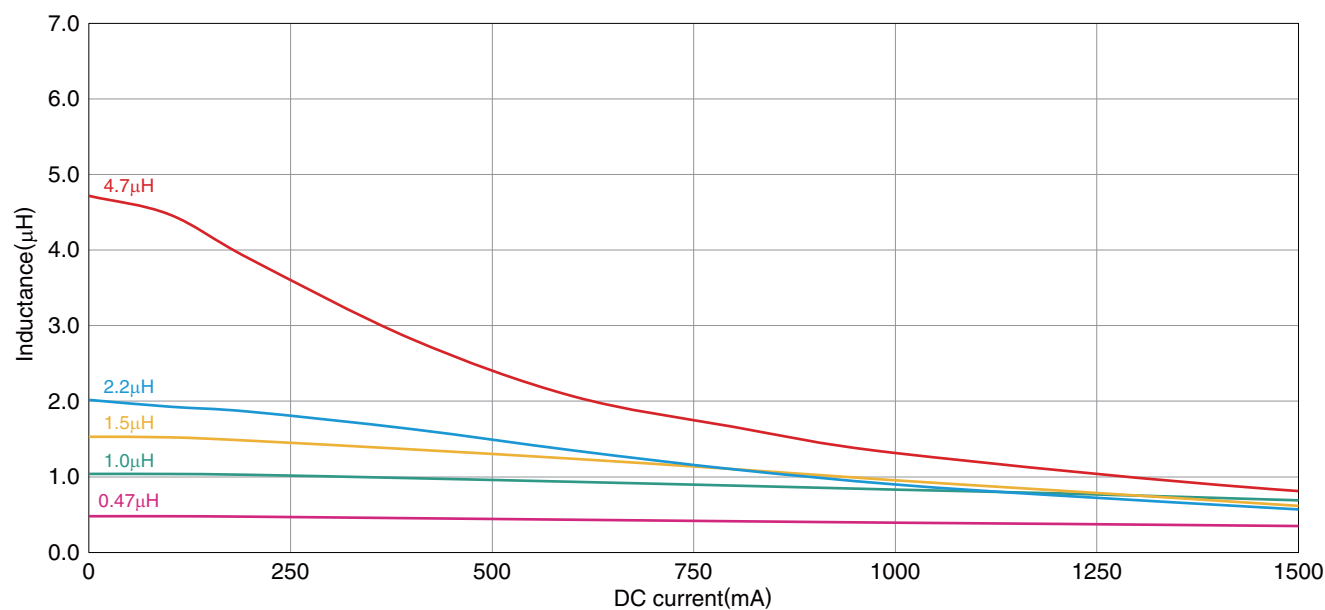
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2016 Type** (S characteristic product, T dimension of the product 1.0mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH



○ Measurement equipment

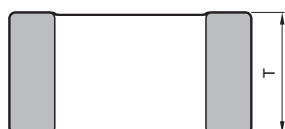
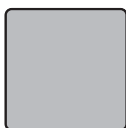
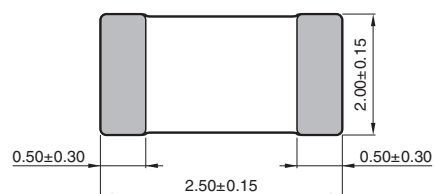
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

MLP<sub>series</sub>

## MLP2520 Type

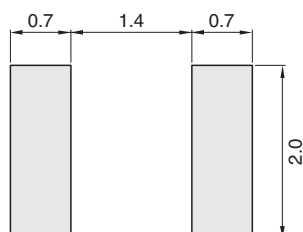
## ■ SHAPE &amp; DIMENSIONS



| T         |
|-----------|
| 0.85±0.15 |
| 1.10±0.10 |

Dimensions in mm

## ■ RECOMMENDED LAND PATTERN



Dimensions in mm

MLP<sub>series</sub> **MLP2520 Type**

## ■ ELECTRICAL CHARACTERISTICS

## □ CHARACTERISTICS SPECIFICATION TABLE

| Type          |                                          | Thickness T<br>(mm) | L    |           | Measuring<br>frequency<br>(MHz) | DC resistance<br>(Ω)±30% | Rated current*<br>(mA) | Part No.**       |
|---------------|------------------------------------------|---------------------|------|-----------|---------------------------------|--------------------------|------------------------|------------------|
|               |                                          | max.                | (μH) | tolerance |                                 |                          |                        |                  |
| Large current | Low resistance                           | 1.0                 | 1.0  | ±20%      | 2                               | 0.048                    | 2300                   | MLP2520K1R0MT□□□ |
|               |                                          | 1.2                 | 1.0  | ±20%      | 2                               | 0.048                    | 2300                   | MLP2520K1R0ST□□□ |
| Low core loss | Emphasized<br>low resistance             | 1.0                 | 0.47 | ±20%      | 2                               | 0.044                    | 2100                   | MLP2520HR47MT□□□ |
|               |                                          | 1.0                 | 1.0  | ±20%      | 2                               | 0.075                    | 1500                   | MLP2520H1R0MT□□□ |
|               |                                          | 1.0                 | 2.2  | ±20%      | 2                               | 0.09                     | 1300                   | MLP2520H2R2MT□□□ |
|               |                                          | 1.0                 | 3.3  | ±20%      | 2                               | 0.13                     | 1000                   | MLP2520H3R3MT□□□ |
|               |                                          | 1.0                 | 4.7  | ±20%      | 2                               | 0.13                     | 1000                   | MLP2520H4R7MT□□□ |
|               |                                          | 1.2                 | 1.0  | ±20%      | 2                               | 0.07                     | 1600                   | MLP2520H1R0ST□□□ |
|               |                                          | 1.2                 | 2.2  | ±20%      | 2                               | 0.08                     | 1500                   | MLP2520H2R2ST□□□ |
|               |                                          | 1.2                 | 4.7  | ±20%      | 2                               | 0.13                     | 1000                   | MLP2520H4R7ST□□□ |
|               | Emphasized<br>DC bias<br>characteristics | 1.0                 | 0.47 | ±20%      | 2                               | 0.06                     | 1700                   | MLP2520VR47MT□□□ |
|               |                                          | 1.0                 | 1.0  | ±20%      | 2                               | 0.10                     | 1300                   | MLP2520V1R0MT□□□ |
|               |                                          | 1.0                 | 1.5  | ±20%      | 2                               | 0.10                     | 1400                   | MLP2520V1R5MT□□□ |
|               |                                          | 1.0                 | 2.2  | ±20%      | 2                               | 0.12                     | 1100                   | MLP2520V2R2MT□□□ |
|               |                                          | 1.0                 | 3.3  | ±20%      | 2                               | 0.20                     | 900                    | MLP2520V3R3MT□□□ |
|               |                                          | 1.0                 | 4.7  | ±20%      | 2                               | 0.24                     | 800                    | MLP2520V4R7MT□□□ |
|               |                                          | 1.2                 | 1.0  | ±20%      | 2                               | 0.10                     | 1300                   | MLP2520V1R0ST□□□ |
|               |                                          | 1.2                 | 1.5  | ±20%      | 2                               | 0.10                     | 1400                   | MLP2520V1R5ST□□□ |
| STD product   |                                          | 1.2                 | 2.2  | ±20%      | 2                               | 0.12                     | 1100                   | MLP2520V2R2ST□□□ |
|               |                                          | 1.2                 | 4.7  | ±20%      | 2                               | 0.22                     | 800                    | MLP2520V4R7ST□□□ |
|               |                                          | 1.0                 | 1.0  | ±20%      | 2                               | 0.085                    | 1500                   | MLP2520S1R0MT□□□ |
|               |                                          | 1.0                 | 1.5  | ±20%      | 2                               | 0.09                     | 1200                   | MLP2520S1R5MT□□□ |
|               |                                          | 1.0                 | 2.2  | ±20%      | 2                               | 0.09                     | 1200                   | MLP2520S2R2MT□□□ |
|               |                                          | 1.0                 | 3.3  | ±20%      | 2                               | 0.13                     | 1000                   | MLP2520S3R3MT□□□ |
|               |                                          | 1.0                 | 4.7  | ±20%      | 2                               | 0.13                     | 1000                   | MLP2520S4R7MT□□□ |
|               |                                          | 1.0                 | 10.0 | ±20%      | 2                               | 0.28                     | 700                    | MLP2520S100MT□□□ |
|               |                                          | 1.2                 | 1.2  | ±20%      | 2                               | 0.08                     | 1500                   | MLP2520S1R0ST□□□ |
|               |                                          | 1.2                 | 2.5  | ±20%      | 2                               | 0.11                     | 1200                   | MLP2520S2R2ST□□□ |
|               |                                          | 1.2                 | 3.3  | ±20%      | 2                               | 0.11                     | 1000                   | MLP2520S3R3ST□□□ |
|               |                                          | 1.2                 | 4.7  | ±20%      | 2                               | 0.11                     | 1000                   | MLP2520S4R7ST□□□ |
|               |                                          | 1.2                 | 10.0 | ±20%      | 2                               | 0.28                     | 700                    | MLP2520S100ST□□□ |

\* Rated current: Current assumed when temperature has risen to 40°C max.

\*\* □□□: Please specify internal code.

## ○ Measurement equipment

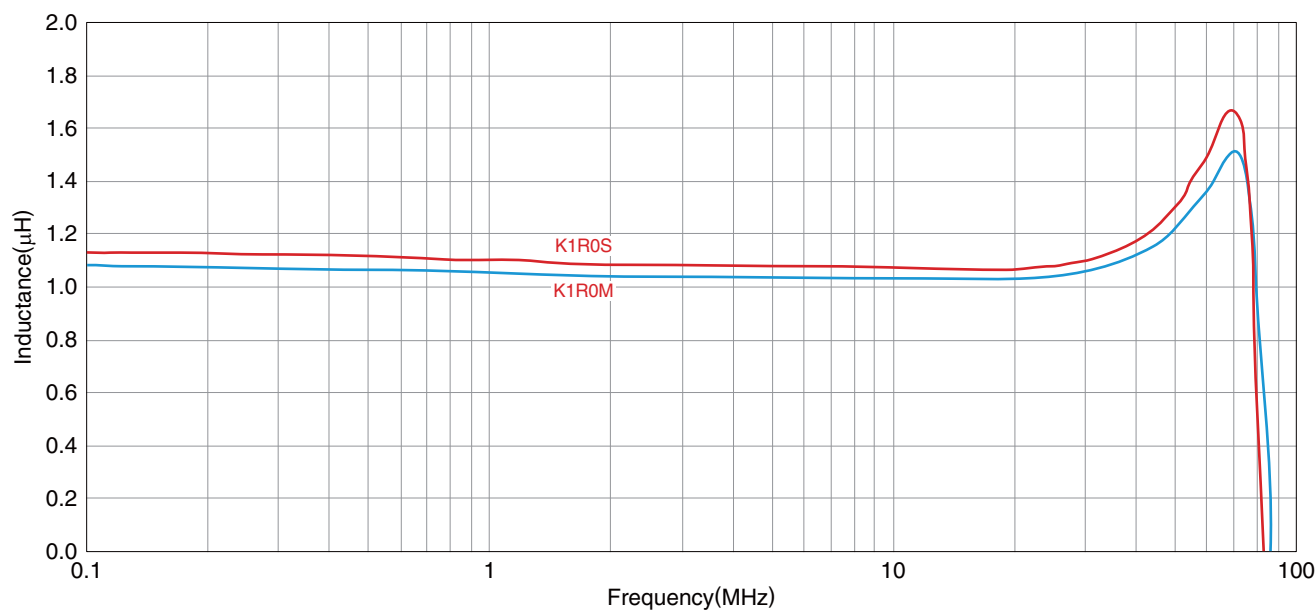
| Measurement item | Product No.  | Manufacturer         |
|------------------|--------------|----------------------|
| L                | 4294A+16034G | Agilent Technologies |
| DC resistance    | Type-7561    | Yokogawa             |

\* Equivalent measurement equipment may be used.

MLP<sub>series</sub> **MLP2520 Type** (K characteristic product)

## ■ ELECTRICAL CHARACTERISTICS

## □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

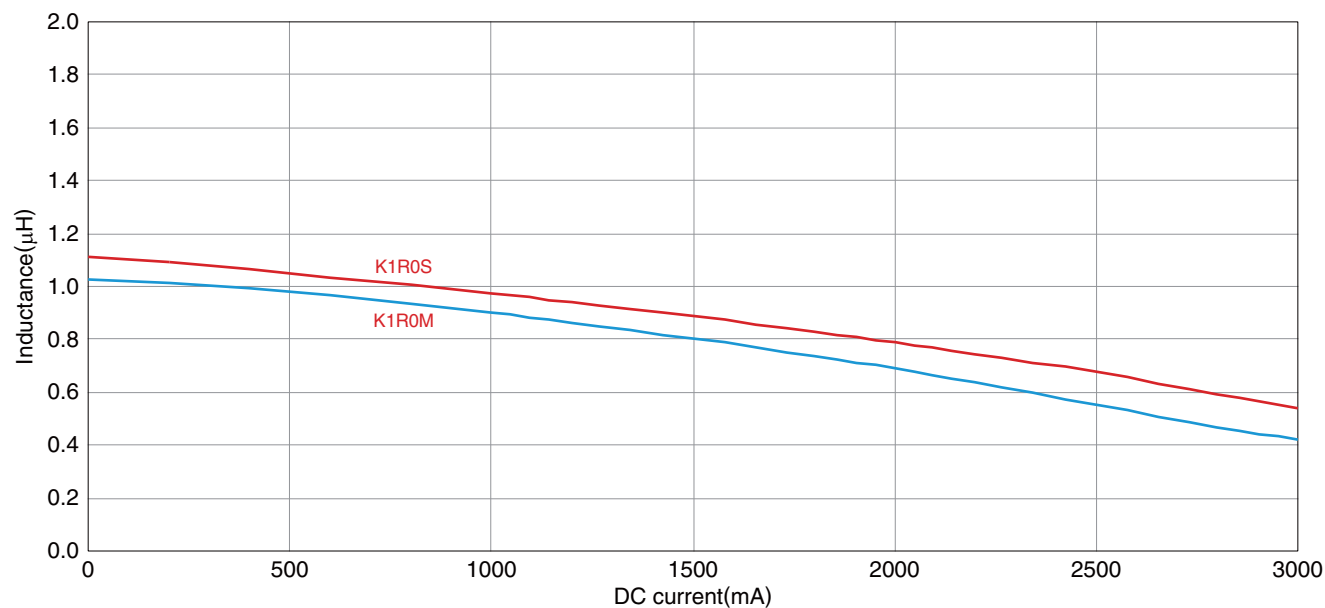
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

MLP<sub>series</sub> **MLP2520 Type** (K characteristic product)

## ■ ELECTRICAL CHARACTERISTICS

## □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH



○ Measurement equipment

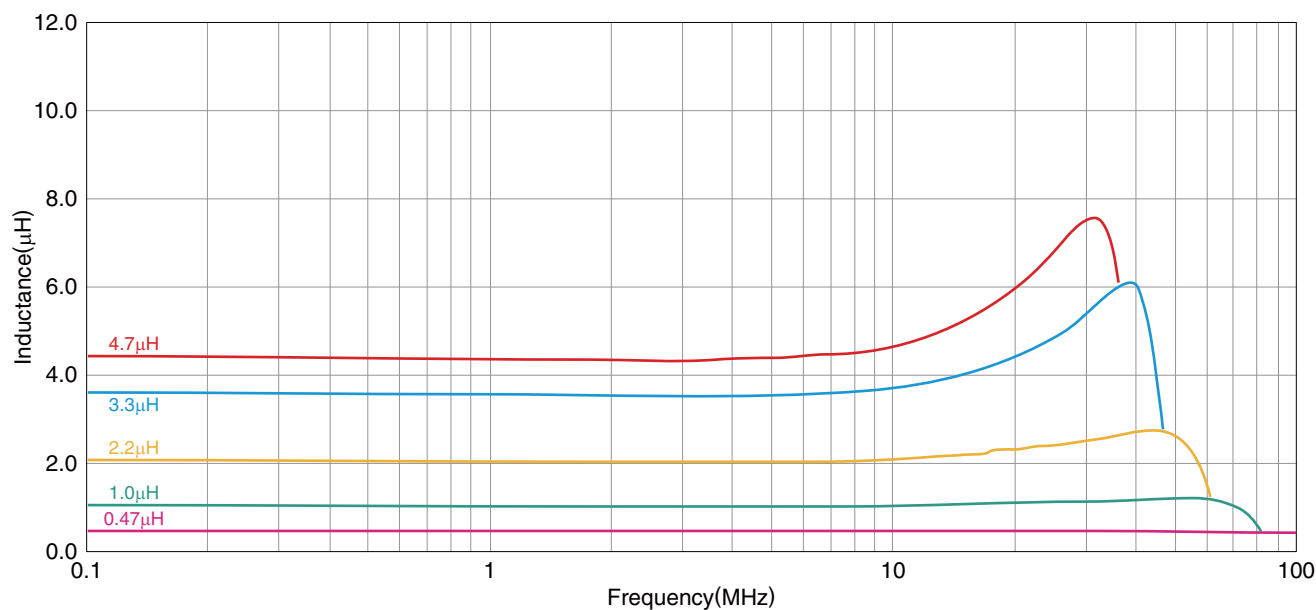
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2520 Type** (H characteristic product, T dimension of the product 1.0mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

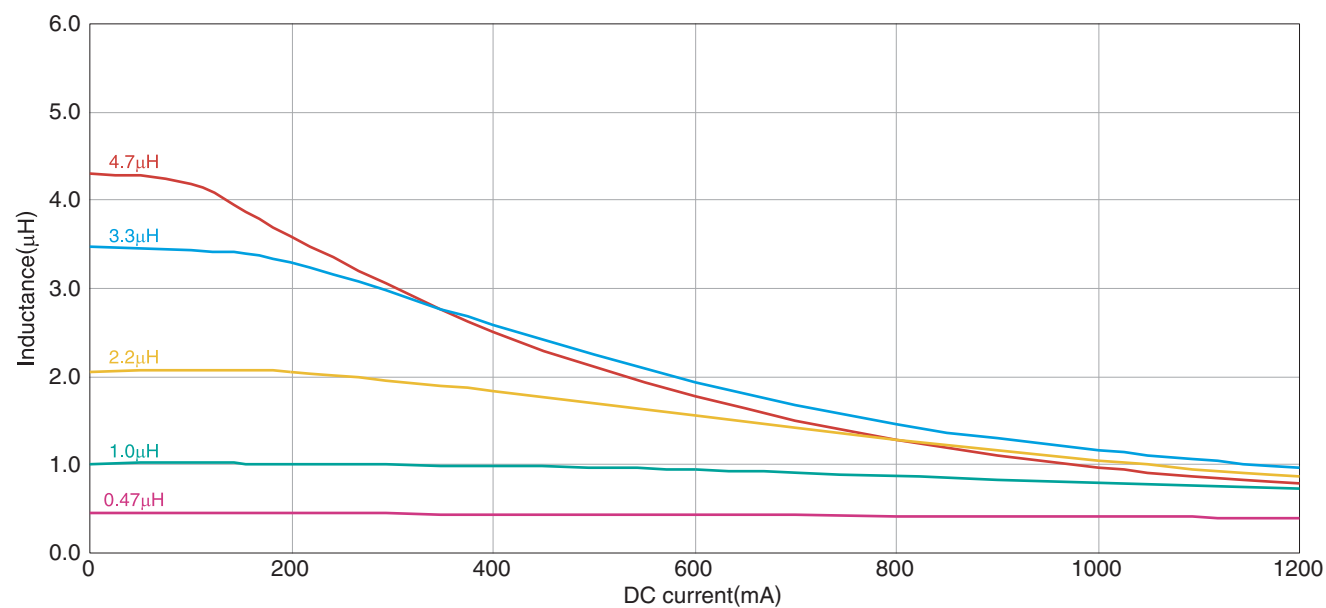
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2520 Type** (H characteristic product, T dimension of the product 1.0mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH



○ Measurement equipment

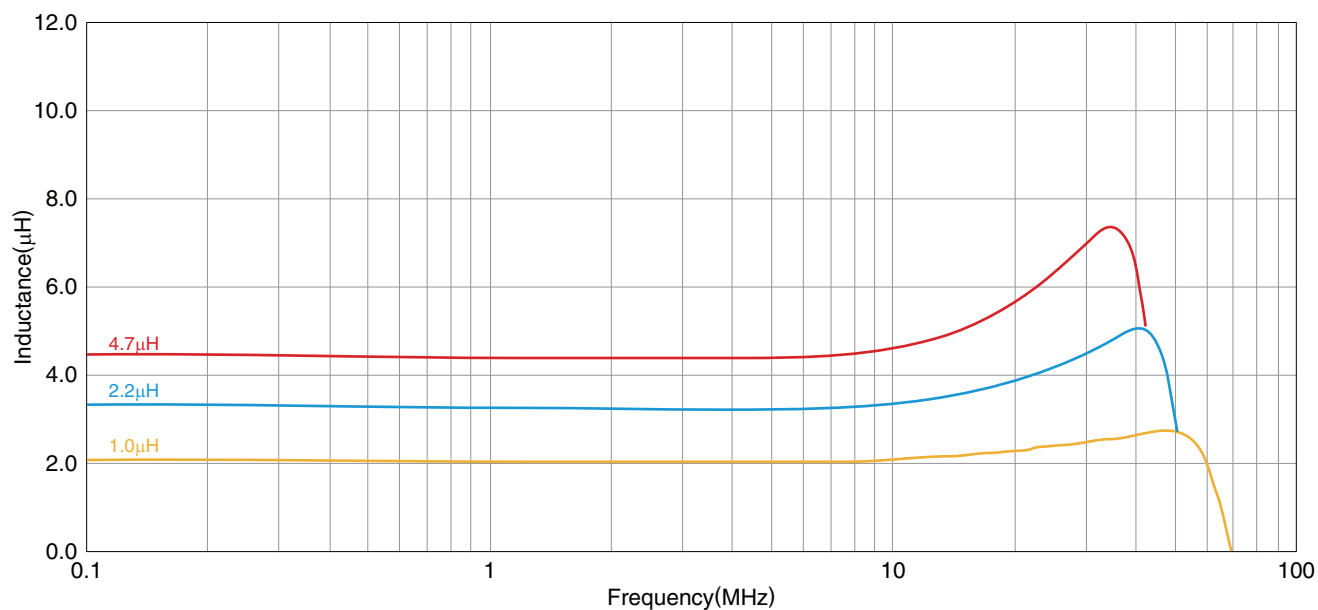
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2520 Type** (H characteristic product, T dimension of the product 1.2mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

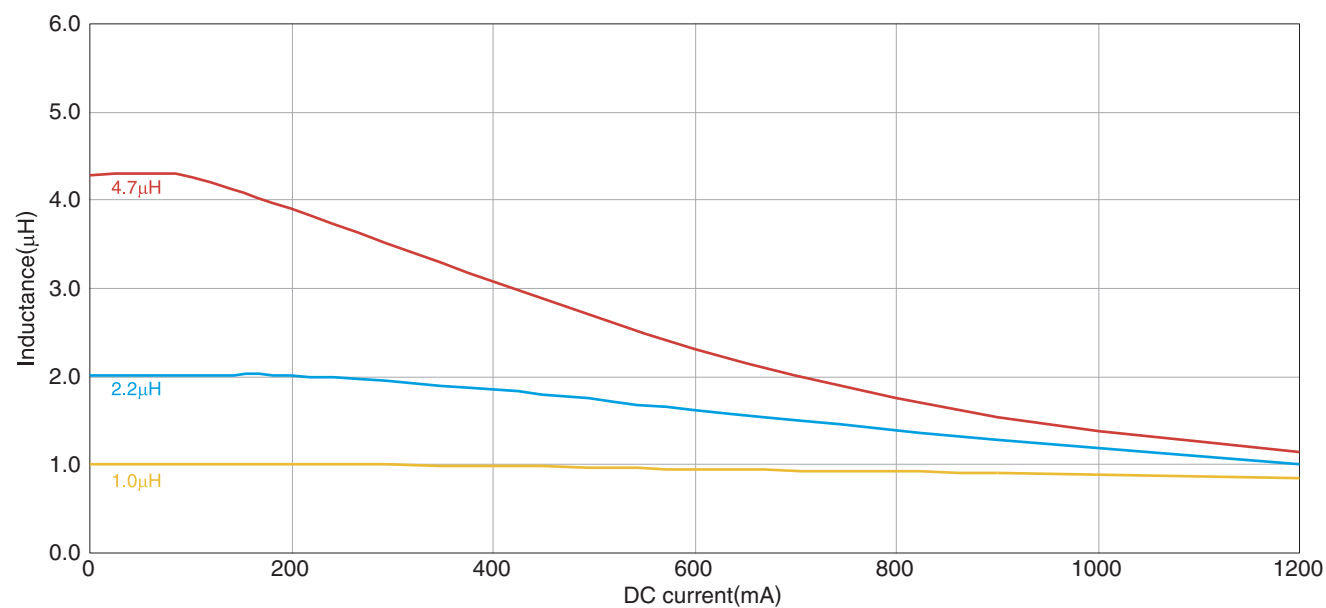
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2520 Type** (H characteristic product, T dimension of the product 1.2mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH



○ Measurement equipment

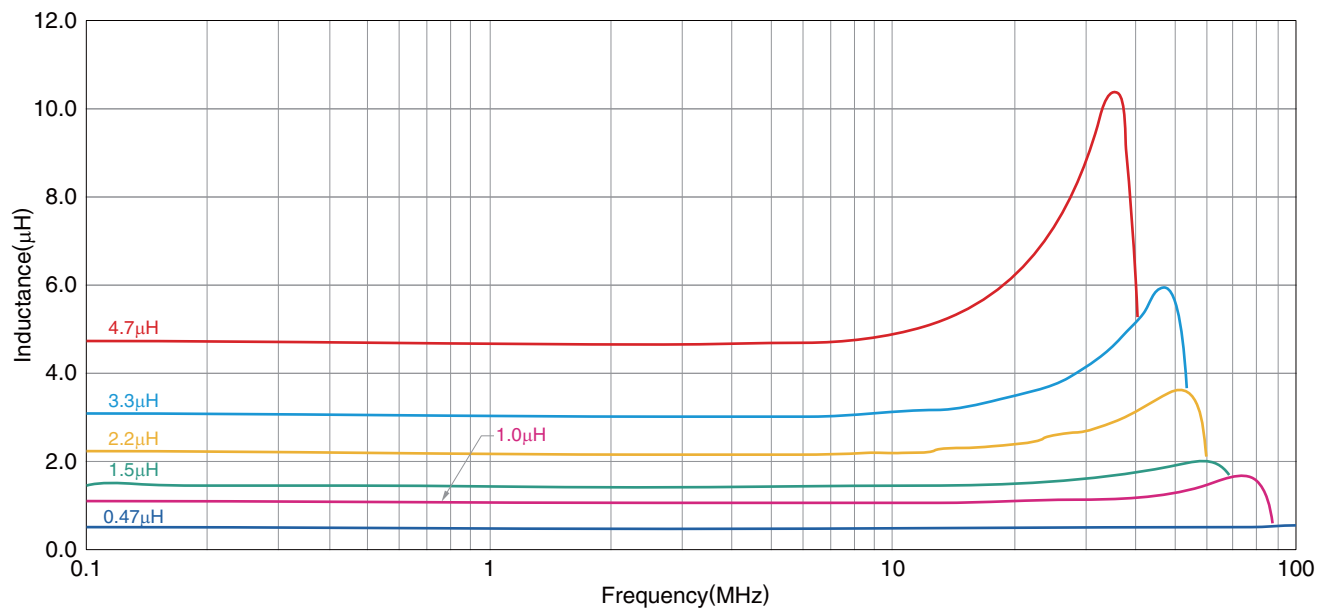
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2520 Type** (V characteristic product, T dimension of the product 1.0mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

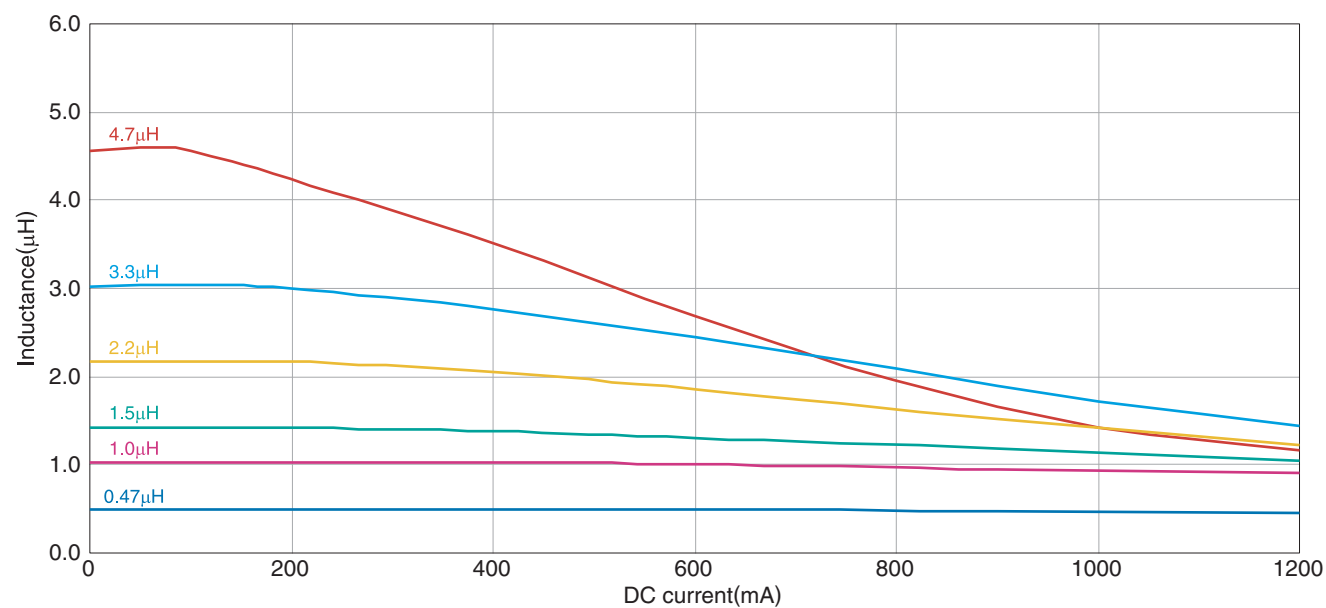
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2520 Type** (V characteristic product, T dimension of the product 1.0mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH



○ Measurement equipment

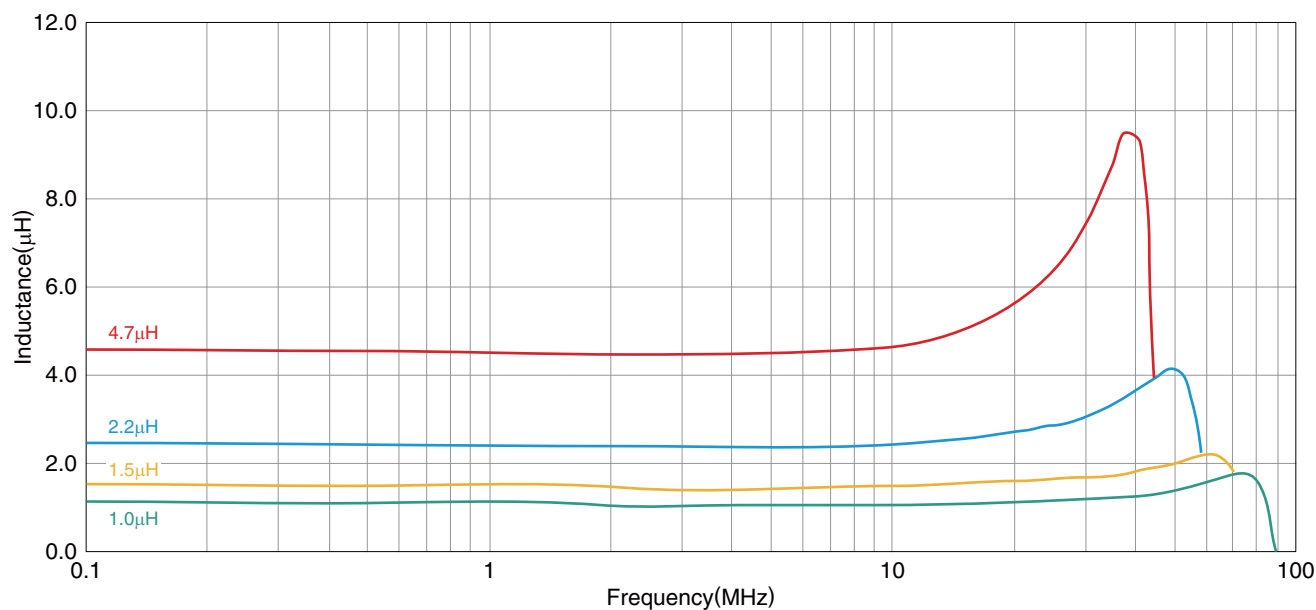
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2520 Type** (V characteristic product, T dimension of the product 1.2mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

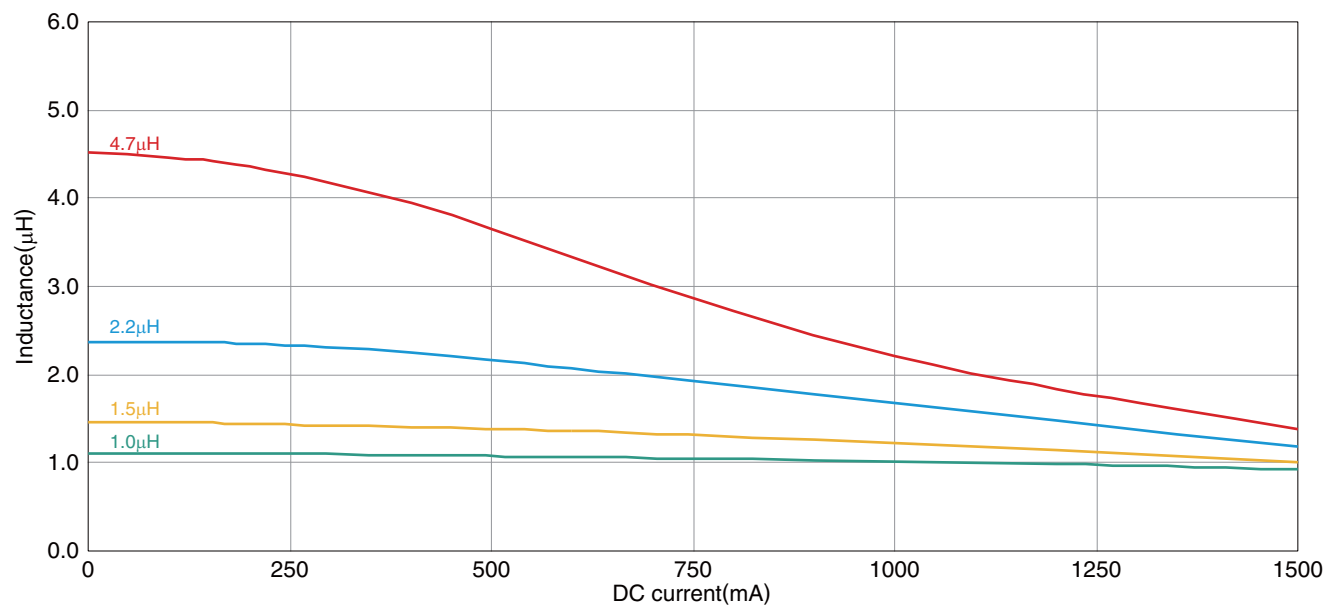
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2520 Type** (V characteristic product, T dimension of the product 1.2mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH



○ Measurement equipment

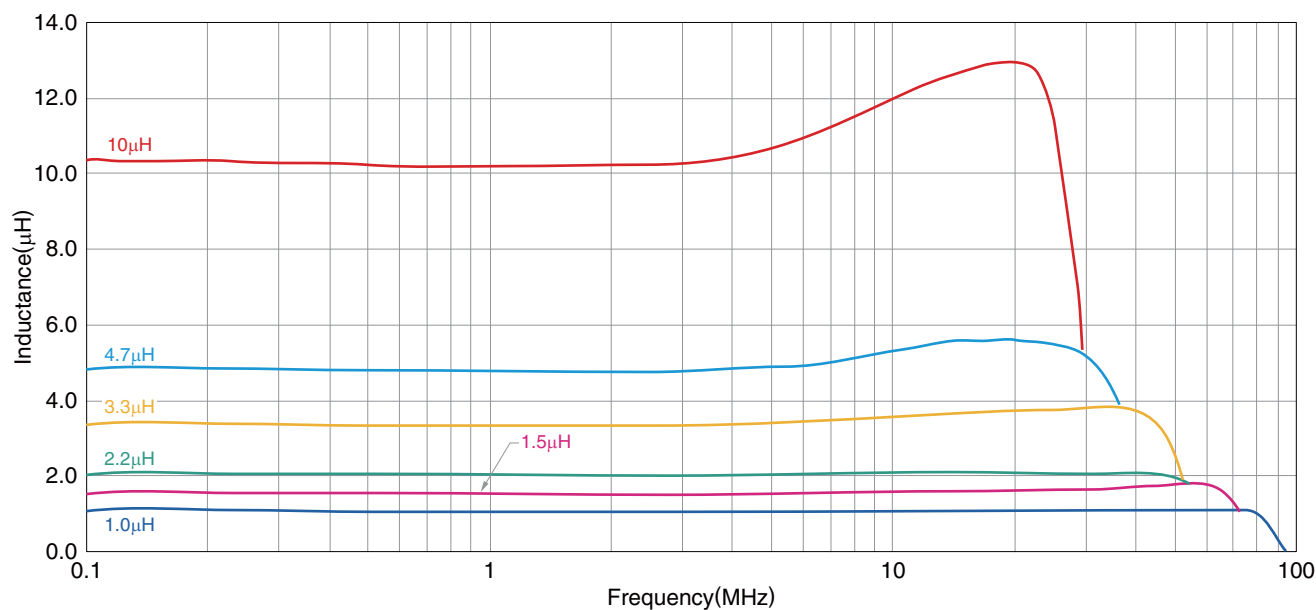
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2520 Type** (S characteristic product, T dimension of the product 1.0mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

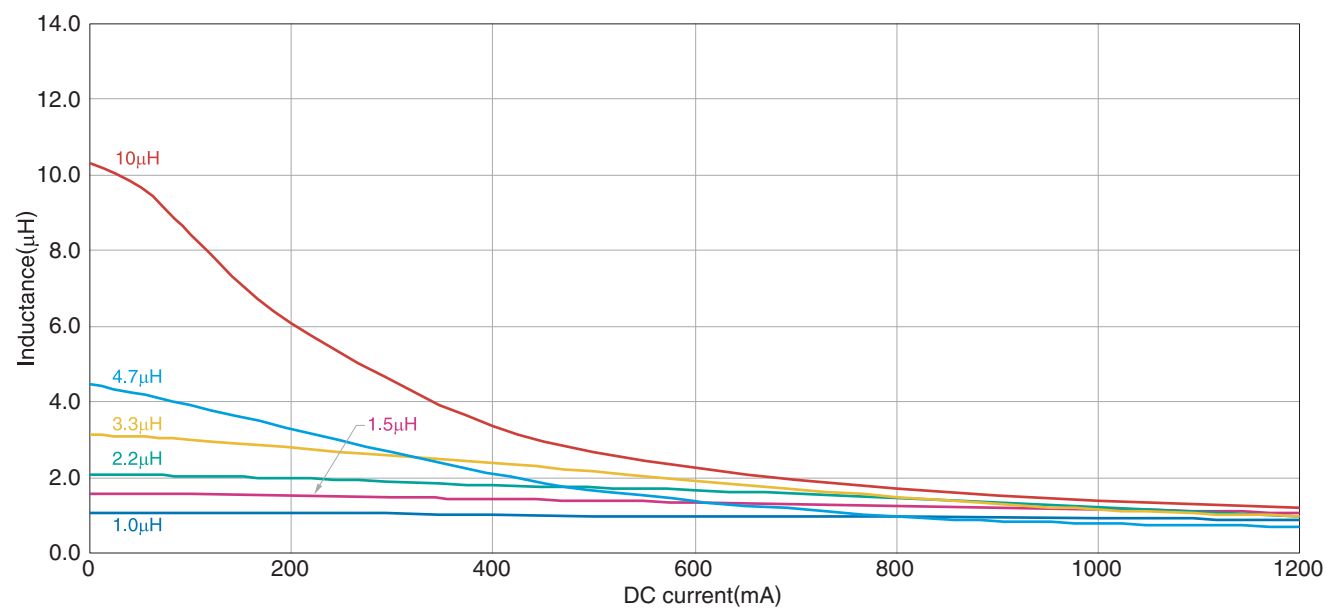
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2520 Type** (S characteristic product, T dimension of the product 1.0mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH



○ Measurement equipment

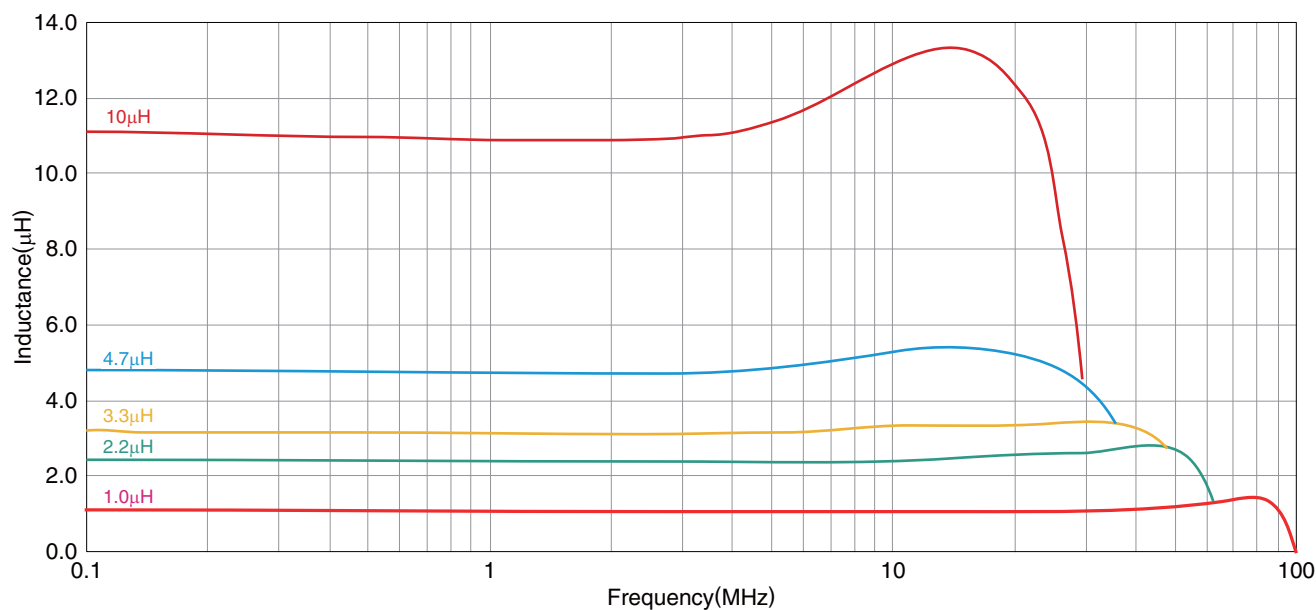
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2520 Type** (S characteristic product, T dimension of the product 1.2mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ L FREQUENCY CHARACTERISTICS GRAPH



○ Measurement equipment

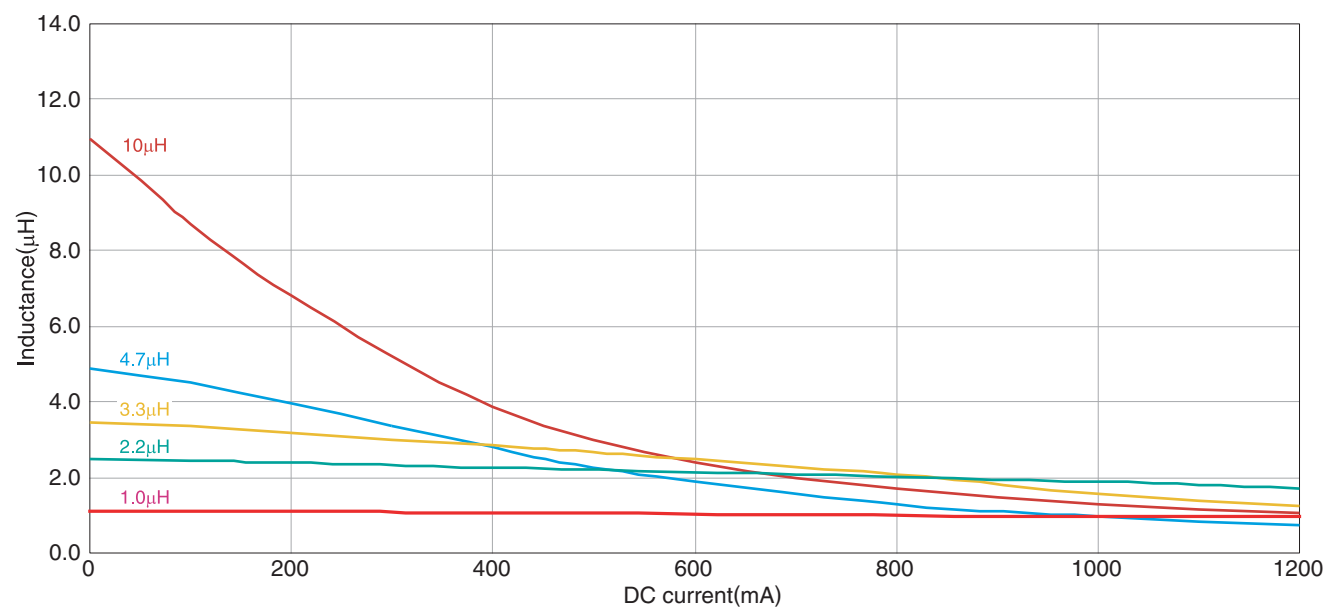
| Product No.  | Manufacturer         |
|--------------|----------------------|
| 4294A+16034G | Agilent Technologies |

\* Equivalent measurement equipment may be used.

# MLP<sub>series</sub> **MLP2520 Type** (S characteristic product, T dimension of the product 1.2mm max.)

## ■ ELECTRICAL CHARACTERISTICS

### □ INDUCTANCE VS. DC BIAS CHARACTERISTICS GRAPH



○ Measurement equipment

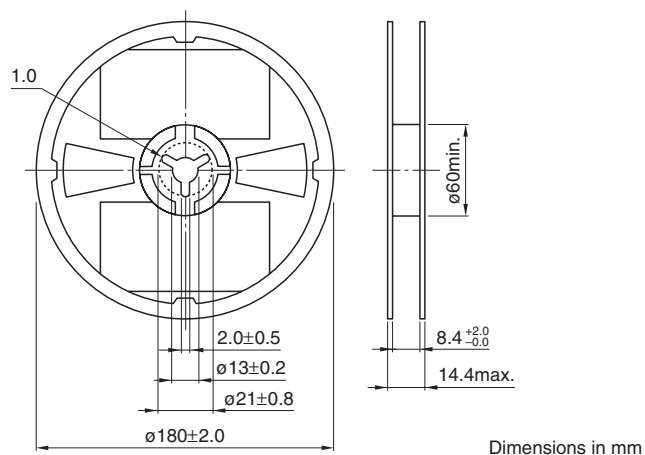
| Product No.                     | Manufacturer         |
|---------------------------------|----------------------|
| 4285A+42841A+42842C+42851-61100 | Agilent Technologies |

\* Equivalent measurement equipment may be used.

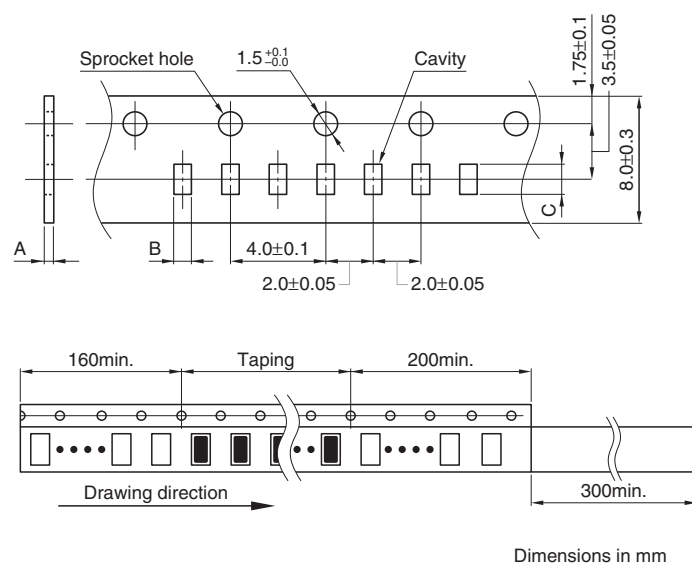
MLP<sub>series</sub>

# Packaging Style

## REEL DIMENSIONS



## TAPE DIMENSIONS



| Type    | A        | B        | C        |
|---------|----------|----------|----------|
| MLP1005 | 1.0 max. | 0.65±0.1 | 1.15±0.1 |
| MLP1608 | 1.1max.  | 1.1±0.2  | 1.9±0.2  |
| MLP2012 | 1.1max.  | 1.5±0.2  | 2.3±0.2  |
| MLP2016 | 1.1max.  | 1.5±0.2  | 2.3±0.2  |
| MLP2520 | 1.5max.  | 2.3±0.2  | 2.7±0.1  |

# Mouser Electronics

Authorized Distributor

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## TDK:

|                                     |                                     |                                     |                                     |                                     |                                     |
|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| <a href="#"><u>MLP2012S1R0T</u></a> | <a href="#"><u>MLP2012S1R5T</u></a> | <a href="#"><u>MLP2012S2R2T</u></a> | <a href="#"><u>MLP2012SR47M</u></a> | <a href="#"><u>MLP2012S1R0M</u></a> | <a href="#"><u>MLP2012S1R5M</u></a> |
| <a href="#"><u>MLP2012S2R2M</u></a> | <a href="#"><u>MLP2012S3R3M</u></a> | <a href="#"><u>MLP2012S4R7M</u></a> | <a href="#"><u>MLP2012SR47T</u></a> | <a href="#"><u>MLP2012SR82T</u></a> | <a href="#"><u>MLP2520S1R0M</u></a> |
| <a href="#"><u>MLP2520S1R5M</u></a> | <a href="#"><u>MLP2520S2R2M</u></a> | <a href="#"><u>MLP2520S3R3M</u></a> | <a href="#"><u>MLP2520S4R7M</u></a> | <a href="#"><u>MLP2520S1R0S</u></a> | <a href="#"><u>MLP2520S2R2S</u></a> |
| <a href="#"><u>MLP2520S3R3S</u></a> | <a href="#"><u>MLP2520S4R7S</u></a> | <a href="#"><u>MLP2016S1R0M</u></a> | <a href="#"><u>MLP2016S1R5M</u></a> | <a href="#"><u>MLP2016S2R2M</u></a> | <a href="#"><u>MLP2016S4R7M</u></a> |
| <a href="#"><u>MLP2016SR47M</u></a> | <a href="#"><u>MLP2012VR47M</u></a> | <a href="#"><u>MLP2520S100S</u></a> | <a href="#"><u>MLP2520H2R2M</u></a> | <a href="#"><u>MLP2520S100M</u></a> | <a href="#"><u>MLP1608VR47B</u></a> |
| <a href="#"><u>MLP2520V4R7S</u></a> | <a href="#"><u>MLP1608V2R2B</u></a> | <a href="#"><u>MLP1608V1R0B</u></a> | <a href="#"><u>MLP1608V1R0D</u></a> | <a href="#"><u>MLP1608VR47D</u></a> | <a href="#"><u>MLP2012V1R0M</u></a> |
| <a href="#"><u>MLP2520H4R7M</u></a> |                                     |                                     |                                     |                                     |                                     |