

Inductors for power circuits

Wound metal

SPM series



SPM10040 type



FEATURES

- Magnetic shield type wound inductor for power circuits using a metallic magnetic material.
- Compared to ferrite wound type inductors, it is possible to achieve large current, low Rdc, and compactness.
- Low inductance variance in high-temperature environments with good DC superimposition characteristics.
- Metallic magnetic material is used, and the structure has an integrated molded coil, so hum noise is lower than with core adhesive coils.
- Operating temperature range: -40 to +125 °C (including self-temperature rise)

APPLICATION

- Note PCs, HDDs, servers, VRMs, compact power supply modules, other

PART NUMBER CONSTRUCTION

SPM	10040	T	-	1R0	M
Series name	L×W×H dimensions 10.7×10.0×4.0 mm	Packaging style		Inductance (μH)	Inductance tolerance

CHARACTERISTICS SPECIFICATION TABLE

L (μH)	Tolerance	Measuring frequency	DC resistance		Rated current*		Part No.
		(kHz)	(mΩ)max.	(mΩ)typ.	Isat (A)typ.	Itemp (A)typ.	
1.0	±20%	100	4.29	3.90	18.0	15.0	SPM10040T-1R0M
2.2	±20%	100	7.48	6.80	12.2	12.0	SPM10040T-2R2M
3.3	±20%	100	11.0	10.0	11.0	9.8	SPM10040T-3R3M
4.7	±20%	100	15.6	14.1	8.0	7.9	SPM10040T-4R7M
6.8	±20%	100	23.3	21.1	7.1	6.9	SPM10040T-6R8M
10.0	±20%	100	29.4	26.7	6.0	5.8	SPM10040T-100M
22.0	±20%	100	79.0	71.8	4.6	3.6	SPM10040T-220M

* Rated current: smaller value of either Isat or Itemp.

Isat: When based on the inductance change rate (20% below the initial value)

Itemp: When based on the temperature increase (temperature increase of 40°C by self heating)

• The cleaning agent can not be used for these products.

Measurement equipment

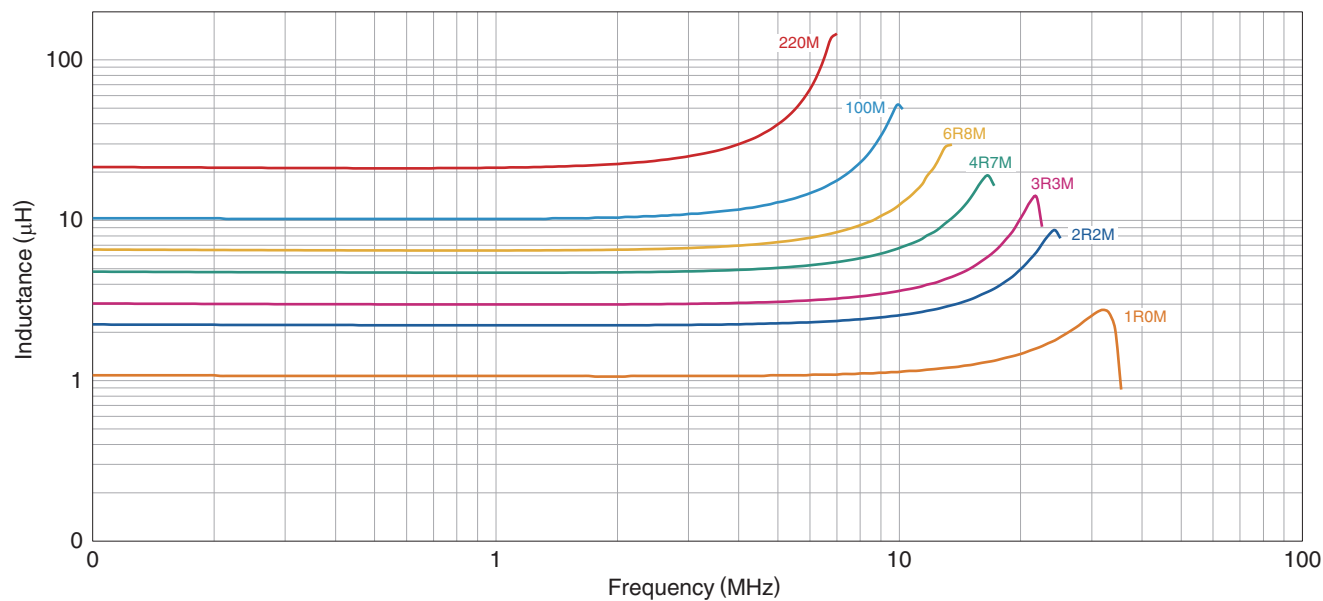
Measurement item	Product No.	Manufacturer
L	4284A	Keysight Technologies
DC resistance	AX-111A	ADEX
Rated current Isat	4284A+42841A+42842C	Keysight Technologies

* Equivalent measurement equipment may be used.



SPM10040 type

L FREQUENCY CHARACTERISTICS

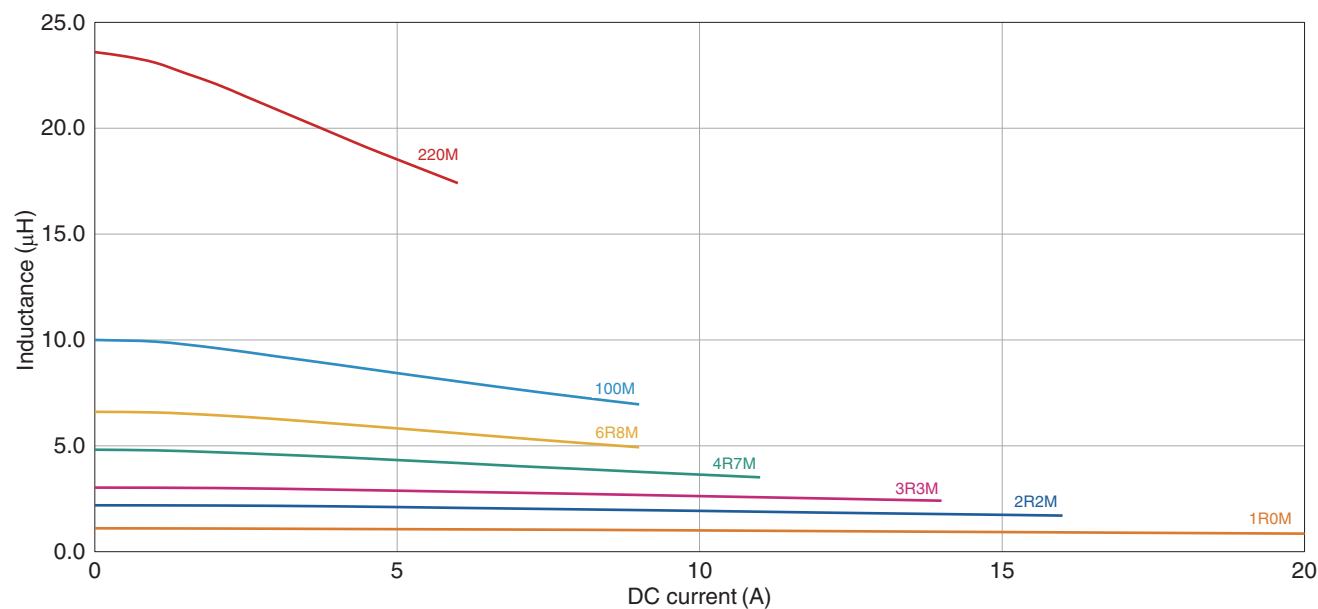


Measurement equipment

Product No.	Manufacturer
4294A	Keysight Technologies

* Equivalent measurement equipment may be used.

INDUCTANCE VS. DC BIAS CHARACTERISTICS



Measurement equipment

Product No.	Manufacturer
4284A+42841A+42842C	Keysight Technologies

* Equivalent measurement equipment may be used.

■ SHAPE & DIMENSIONS



Dimensions in mm

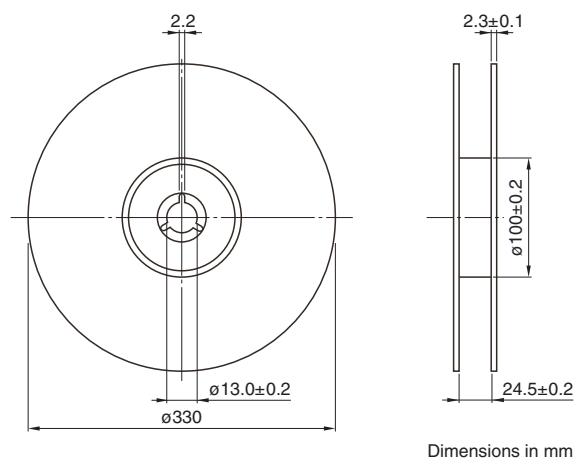
The graph illustrates the temperature profile of a heat treatment process. The y-axis represents Temperature and the x-axis represents Time. The process is divided into three main stages:

- Preheating:** The temperature rises from 150°C to 180°C over a duration of 120s.
- Soldering:** The temperature continues to rise from 180°C to a peak of 260°C. The time to reach the peak is labeled as 10s max. The total time for this stage is 30s.
- Natural cooling:** The temperature decreases from the peak of 260°C back down to 230°C.

Key temperature points and times are marked on the graph:

- 150°C (Start of Preheating)
- 180°C (End of Preheating)
- 230°C (End of Soldering)
- 260°C (Peak Temperature)
- 120s (Duration of Preheating)
- 30s (Duration of Soldering)
- 10s max. (Time to reach peak from 180°C)

REEL DIMENSIONS



Technical drawing of a sprocket hole plate. The drawing shows a side view and a top view. The side view shows a plate with a thickness of 0.4 mm and a width of K. The top view shows a rectangular plate with a width of B and a length of 16.0 ± 0.1 mm. There are six sprocket holes, each with a diameter of 1.5 ± 0.1 mm. The center-to-center distance between the holes is 2.0 ± 0.1 mm. The distance from the center of the first hole to the left edge is 1.5 ± 0.1 mm. The distance from the center of the last hole to the right edge is 1.75 ± 0.1 mm. The total distance from the center of the first hole to the center of the last hole is 11.5 ± 0.1 mm. The plate has a cavity on the right side with a width of 24.0 ± 0.3 mm. The distance from the center of the last hole to the right edge of the cavity is 4.0 ± 0.1 mm. The text "Sprocket hole" and "Cavity" are used as labels. The text "Dimensions in mm" is at the bottom right.

☐ **PACKAGE QUANTITY**

■ TEMPERATURE RANGE, INDIVIDUAL WEIGHT

** The storage temperature range is for after the assembly.

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 this products.

REMINDERS

- The storage period is within 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.