

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	LxWxH dimensions 10.7x10.0x4.0 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

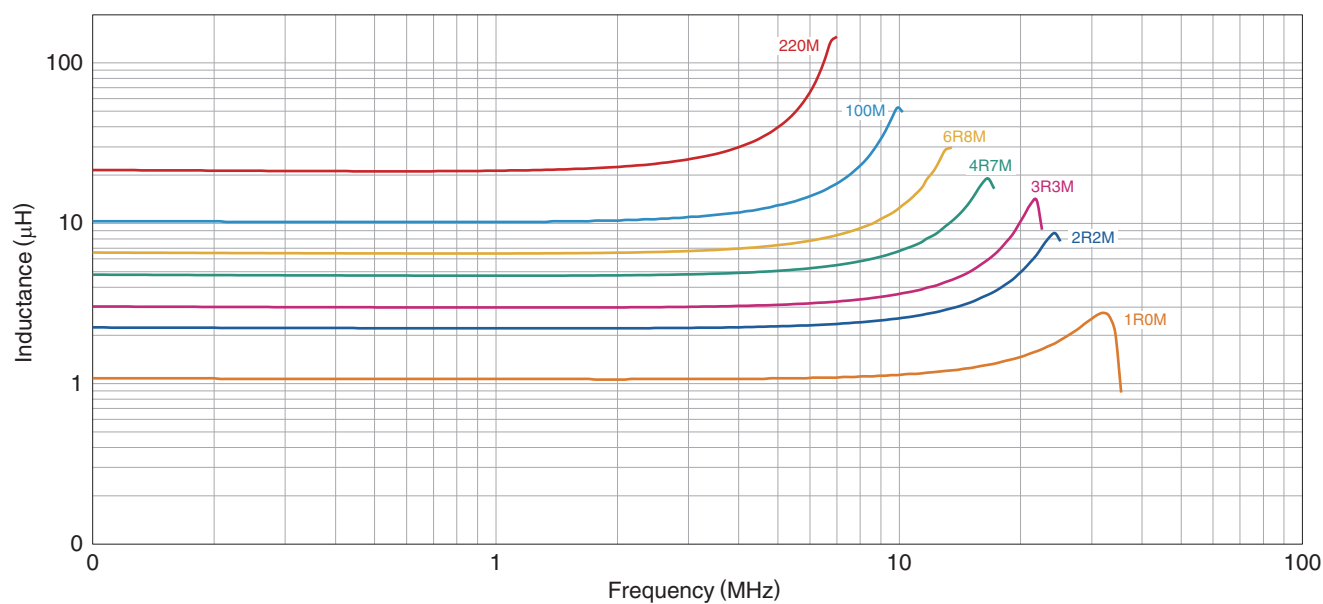
Measurement item	Product No.	Manufacturer
L	4284A	Keysight Technologies
DC resistance	AX-111A	ADEX
Rated current Isat	4284A+42841A+42842C	Keysight Technologies

* Equivalent measurement equipment may be used.



SPM10040 type

L FREQUENCY CHARACTERISTICS

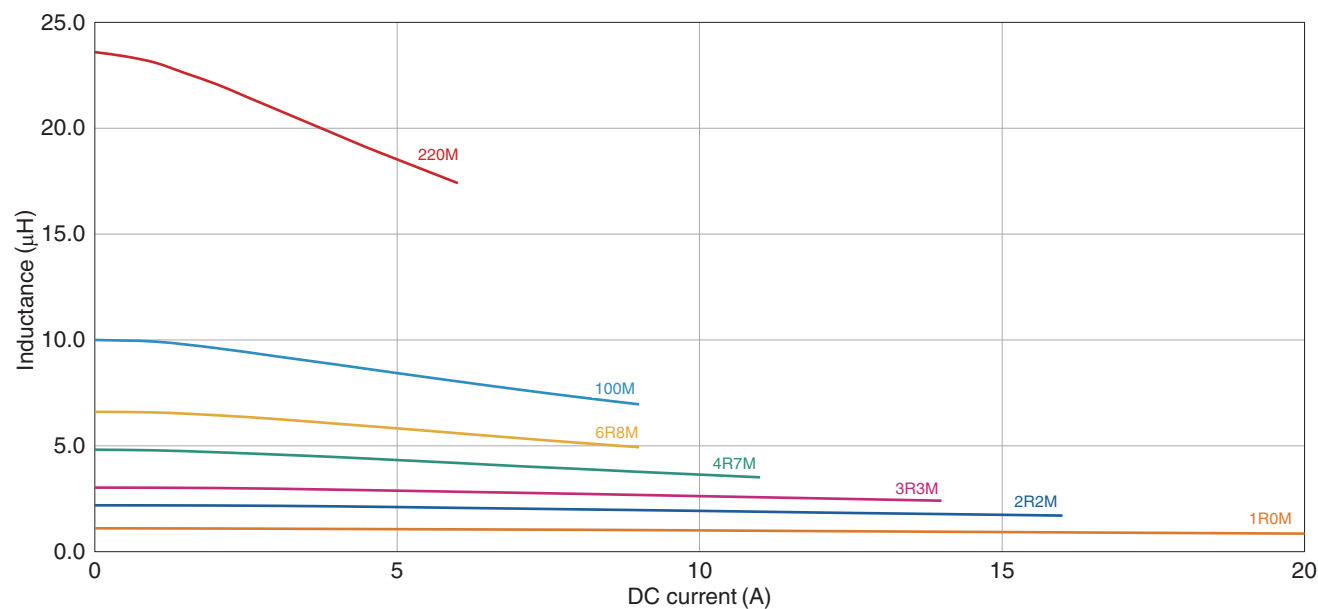


Measurement equipment

Product No.	Manufacturer
4294A	Keysight Technologies

* Equivalent measurement equipment may be used.

INDUCTANCE VS. DC BIAS CHARACTERISTICS

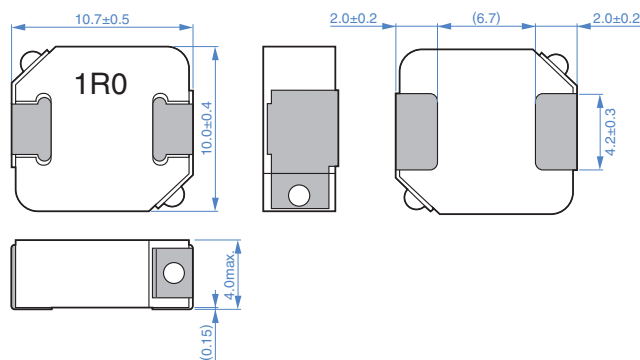


Measurement equipment

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

* Equivalent measurement equipment may be used.

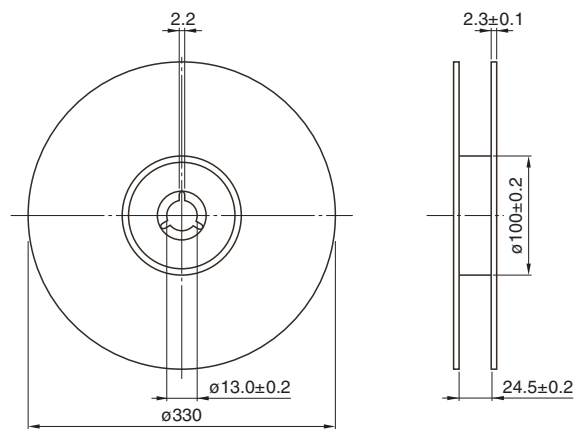
■ SHAPE & DIMENSIONS



Dimensions in mm

Dimensions in mm

REEL DIMENSIONS



Dimensions in mm

Technical drawing of a mechanical part, likely a sprocket, showing dimensions and labels. The drawing includes a side view on the left and a top view on the right.

Dimensions:

- Side view (left):
 - Overall width: 0.4
 - Feature height: 0.4
 - Feature width: 0.4
 - Feature depth: 0.4
 - Feature thickness: 0.4
- Top view (right):
 - Overall length: 16.0 ± 0.1
 - Overall width: 24.0 ± 0.3
 - Feature width: $1.5^{+0.1}_{-0}$
 - Feature width: 2.0 ± 0.1
 - Feature width: 4.0 ± 0.1
 - Feature width: 1.75 ± 0.1
 - Feature width: 11.5 ± 0.1

Labels:

- Sprocket hole
- Cavity
- Feature A (indicated by a dashed line and arrow)
- Feature B (indicated by a dashed line and arrow)
- Feature K (indicated by a dashed line and arrow)

Dimensions in mm

Type	A	B	K
SPM10040	10.5	11.6	4.2

The graph illustrates the temperature profile of a soldering process. The y-axis represents Temperature and the x-axis represents Time. The process is divided into three main stages: Preheating, Soldering, and Natural cooling. The temperature starts at 150°C, rises to 180°C over a 120s preheating period. It then rises to a peak of 260°C during the soldering stage, which lasts for a maximum of 10s. The total time for the soldering stage (from 180°C to 230°C) is 30s. Finally, the temperature decreases during the natural cooling stage.

Stage	Temperature Range (°C)	Duration (s)
Preheating	150°C to 180°C	120s
Soldering	180°C to 230°C	30s
Peak Soldering	260°C	10s max.
Natural cooling	230°C to 150°C	-

Package quantity	500 pcs/reel
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Operating temperature range*	Storage temperature range**	Individual weight
-40 to +125 °C	-40 to +125 °C	1.96 g

* Operating temperature range includes self-temperature rise.

** 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.