# SMD Power Inductors (with tube / also shielded)

FASTRON power inductors can withstand a wide temperature range. The inductance values range from 1.0 µH to 10000 µH and they are suitable for high rated currents. They have a high reliability and can be assembled by surface mount technology. Their low DC resistance keeps power losses to a minimum.
They are also suitable for Filtering of supply voltages, Coupling, Decoupling, Automotive electronics and Network switching systems.

## Applications

These components are widely used in power supplies for VTR, LCD TV, notebooks, PC and DC/DC converters.

## Technical Data

| | |
|---|---|
| L – Value (rated inductance) | Measured with Bode 100 Vector Network Analyzer or equivalent at frequency $f_L$ |
| SRF (min) – (unshielded only) | Measured with HP 8753ES Network Analyzer or equivalent |
| DCR (max) | Measured at 25°C |
| Rated DC Current | Isat max. current based on inductivity drop of 10% (PISG, PISL, PISM, PISMHV, PISP, PISPHV, PISN, PISNHV, PISR, PIST, PISTHV, PISA4119 & PIHV4119) related to the unloaded inductivity.<br><br>I ΔT max. and IR current based on temperature rise: determined at the point where the temperature rise does not exceed 30°C (PISG) respectively 40°C (PISL, PISM, PISMHV, PISP, PISPHV, PISN, PISNHV, PISR, PIST, PISTHV, PISA4119, PIHV4119 & SPISM) above the ambient temperature of 25°C.<br><br>I rated current indicates the current when inductivity drop of 25% max related to the unloaded inductivity or when temperature raise ΔT=40°C (Ta=20°C) whichever is lower (PISA2408, PISA2416, PISA2812, PISA2816, PISA4716, PISA4720 & PISA4728) |
| Operating Temperature | Non shielded: -40°C to +150°C (including component self-heating)<br>Shielded and tube: -40°C to +125°C (including component self-heating) |
| Recommended soldering method | Reflow |
| Moisture Sensitivity Levels (MSL) (Non-shielded) | MSL Level 1, indicating unlimited floor life at ≤ 30°C / 85% relative humidity |
| Solderability | Using lead free solder (Sn 99.9) at 260°C ± 5°C for 5 ± 0.5 seconds, min 90% solder coverage of metallization<br>Standard: IEC 68-2-20 (Ta) |
| Resistance to Soldering Heat | Resistant to 260°C ± 5°C for 10 ± 1 seconds<br>Standard: IEC 68-2-20 (Tb) |
| Resistance to Solvent | Resistant to Isopropyl alcohol for 5 ± 0.5 minutes at 23°C ± 5°C<br>Standard: IEC 68-2-45 |
| Climatic Test | Defined by the following standards<br>IEC 68-2-1 for Cold test: -55°C for 96 hours<br>IEC 68-2-2 for Dry heat test: +125°C for 96 hours<br>IEC 60068-2-78 for Humidity test: 40°C at RH 95% for 4 days |
| Thermal Shock Test (Non-shielded) | Temperature cycle : -40°C to +125°C to -40°C<br>Max/Min temperature duration: 15 minutes<br>Temperature transition duration: 5 minutes<br>Cycles: 25<br>Standard: MIL-STD-202G |
| Adhesion of Soldered Component (Shear Test) | Components withstand a pushing force of 20N for 10 ± 1 seconds<br>Standard: IEC 60068-2-21, method $Ue_3$ |
| Mechanical Shock | Mil-Std 202 Method 213<br>Condition C<br>3 axis, 6 times, total 18 shocks<br>100 G, 6 ms, half-sine |
| Vibration | Mil-Std 202 Method 204<br>20 mins at 5G<br>10 Hz to 2000 Hz<br>12 cycles each of 3 orientations |

## Ordering Code

Example: PISA2408-2R9X-YY

PISA (Model) 2408 (Case Size) - 2R9 (Inductance Value) X (Tolerance) - YY (Packing Code) ➔ PISA2408-2R9N-04

Case Sizes - 2408, 2416, 2812, 2816, 4119, 4716, 4720, 4728, G, L, M, P, N, R, T
Core Type - Ferrite
Tolerances - K (10%), M (20%), N (30%)
Packing Code - 01, 04 (Taped / Reel)

# SMD Power Inductors (also shielded)

## Packing Specification

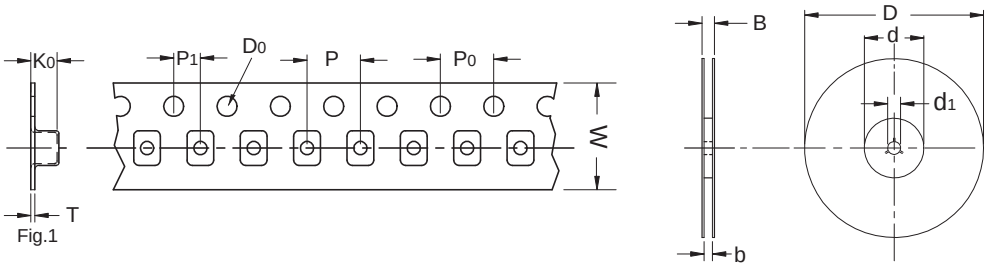


Fig.1

drawing only schematic, see table

| Type | D | D0 | d | d1 | B | b | W | P | P0 | P1 | K0 | T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PISG | 180 | 1.55 | 60 | 13 | 18.4 | 12.4 | 12 | 8 | 4 | 2 | 2.9 | 0.25 |
| PISL | 330 | 1.50 | 100 | 13 | 30.4 | 24.4 | 24 | 12 | 4 | 2 | 3.6 | 0.30 |
| PISM / SPISM / PISMHV | 330 | 1.50 | 100 | 13 | 30.4 | 24.4 | 24 | 12 | 4 | 2 | 5.4 | 0.40 |
| PISP / PISPHV | 330 | 1.50 | 100 | 13 | 30.4 | 24.4 | 24 | 16 | 4 | 2 | 8.5 | 0.50 |
| PISN / PISNHV | 330 | 1.50 | 100 | 13 | 30.4 | 24.4 | 24 | 16 | 4 | 2 | 11.6 | 0.50 |
| PISR | 330 | 1.50 | 100 | 13 | 38.4 | 32.4 | 32 | 24 | 4 | 2 | 7.6 | 0.40 |
| PIST / PISTHV | 330 | 1.50 | 100 | 13 | 38.4 | 32.4 | 32 | 24 | 4 | 2 | 12.5 | 0.50 |
| PISA2408 / PISA2416 | 330 | 1.55 | 100 | 13 | 22.4 | 16.4 | 16 | 12 | 4 | 2 | 5.1 | 0.35 |
| PISA2812 | 330 | 1.55 | 100 | 13 | 22.4 | 16.4 | 16 | 12 | 4 | 2 | 3.6 | 0.35 |
| PISA2816 | 330 | 1.55 | 100 | 13 | 22.4 | 16.4 | 16 | 12 | 4 | 2 | 4.6 | 0.40 |
| PISA4119 / PIHV4119 | 330 | 1.50 | 100 | 13 | 30.4 | 24.4 | 24 | 16 | 4 | 2 | 5.7 | 0.50 |
| PISA4716 | 330 | 1.55 | 100 | 13 | 30.4 | 24.4 | 24 | 16 | 4 | 2 | 6.1 | 0.50 |
| PISA4728 / PISA4720 | 330 | 1.55 | 100 | 13 | 30.4 | 24.4 | 24 | 16 | 4 | 2 | 8.1 | 0.40 |

# FASTRON's Component Key Characteristics


Approved according to AEC-Q200


Approved according to AEC-Q200 with High Temperature

Suitable for High Temperature

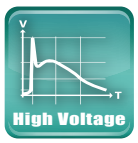

Part is RoHS conform and Halogen free


Mechanical Shock and Vibration Proof


Designed for High Q-values


Exceptionally High Q-values

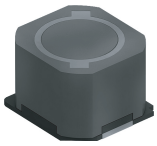

Optimized for High Currents

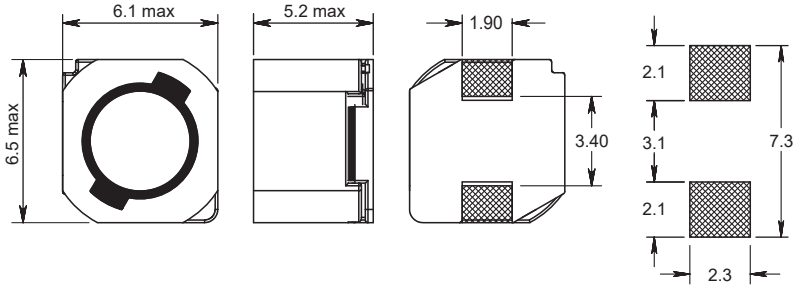



Optimized for High Voltages

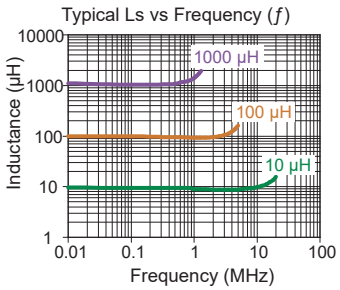
# PISA 2416

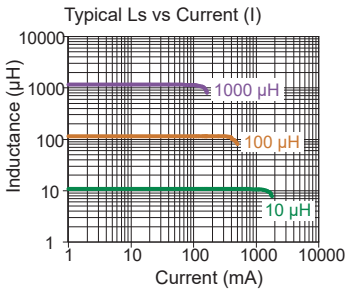
**Magnetically Shielded**






Recommended layout
for solder pads




| Part No | Inductance L (µH) | $f_L$ (kHz) | Tol ± (%) | DCR max (Ω) | Rated DC Current I (A) |
|---|---|---|---|---|---|
| PISA2416-4R7M-04 | 4.7 | 1 | 20 | 0.09 | 2.40 |
| PISA2416-100M-04 | 10 | 1 | 20 | 0.12 | 1.35 |
| PISA2416-120M-04 | 12 | 1 | 20 | 0.13 | 1.20 |
| PISA2416-150M-04 | 15 | 1 | 20 | 0.18 | 1.10 |
| PISA2416-180M-04 | 18 | 1 | 20 | 0.24 | 1.00 |
| PISA2416-220M-04 | 22 | 1 | 20 | 0.27 | 0.91 |
| PISA2416-270M-04 | 27 | 1 | 20 | 0.3 | 0.82 |
| PISA2416-330M-04 | 33 | 1 | 20 | 0.33 | 0.75 |
| PISA2416-390M-04 | 39 | 1 | 20 | 0.37 | 0.69 |
| PISA2416-470M-04 | 47 | 1 | 20 | 0.52 | 0.62 |
| PISA2416-560M-04 | 56 | 1 | 20 | 0.56 | 0.58 |
| PISA2416-680M-04 | 68 | 1 | 20 | 0.63 | 0.52 |
| PISA2416-820M-04 | 82 | 1 | 20 | 0.71 | 0.47 |
| PISA2416-101M-04 | 100 | 1 | 20 | 1.03 | 0.43 |
| PISA2416-121M-04 | 120 | 1 | 20 | 1.15 | 0.39 |
| PISA2416-151M-04 | 150 | 1 | 20 | 1.68 | 0.35 |
| PISA2416-181M-04 | 180 | 1 | 20 | 1.87 | 0.32 |
| PISA2416-221M-04 | 220 | 1 | 20 | 2.08 | 0.29 |
| PISA2416-271M-04 | 270 | 1 | 20 | 2.37 | 0.26 |
| PISA2416-331M-04 | 330 | 1 | 20 | 2.67 | 0.23 |
| PISA2416-391M-04 | 390 | 1 | 20 | 2.94 | 0.22 |
| PISA2416-471M-04 | 470 | 1 | 20 | 3.93 | 0.2 |
| PISA2416-561M-04 | 560 | 1 | 20 | 5.43 | 0.18 |
| PISA2416-681M-04 | 680 | 1 | 20 | 7.32 | 0.17 |
| PISA2416-821M-04 | 820 | 1 | 20 | 8.24 | 0.15 |
| PISA2416-102M-04 | 1000 | 1 | 20 | 9.26 | 0.14 |

**Core Material:** Ferrite
**Base Material:** Plastic

Revision date: 25 Jul 2018

**SPQ:** Taped / Reel 1000 [-04]

**Remarks:** - Additional gluing to PCB board is recommended.
- I - see description in Inductors Technical Data.

SMD Power Inductors

● All dimensions in mm