

Chip Low DCR Power Inductors

Token Introduces Surface Mount Power Inductors Low DCR (TPSDC)



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▶ Preview

To meet the electrical demands of next-generation products such as microprocessors, high-current dc/dc converters and telecom equipment, the TPSDC SMT Power Inductors from Token Electronic targets applications that require wide range inductance, lower DCR and high current.

Token TPSDC series of shielded, surface-mount wire-wound inductors features a profile ranging from 2.92 mm, 5.08 mm, to 7.62 mm, and is suited for use in low-profile DC-DC converters and switch-mode power supplies used in power telecommunications systems, industrial controls, and medical instrumentation.

All parts are magnetically shielded to avoid electromagnetic interference with surrounding circuitry. Electrical parameters include an inductance of 1.0 μH to 10000.00 μH , resistance of 0.021 ohms to 32.800 ohms, and a rated current of 0.02A to 8.00A. The inductors also operate from -40°C to $+85^{\circ}\text{C}$.

The power inductors are wound around a ferrite core and are particularly suitable for cost-critical mass applications and the surface-mounting capability. The TPSDC series conform to the RoHS directive and Lead-free. Custom parts are available on request for tighter tolerances. Application of shielded inductors specific designs also available including different inductance and frequency specifications adjusted to requirements.

Please contact our sales representative for more information.

▶ Quick Selection

Characteristics :

- Operating temperature range: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$.
- Temperature Rise Current (I_{rms}): The actual current when temperature of coil becomes $\Delta 40^{\circ}\text{C}$. ($T_a = 25^{\circ}\text{C}$).
- Saturation Rated Current (IDC): The DC current when the inductance becomes 10% lower than its initial value. ($T_a = 25^{\circ}\text{C}$).

Features :

- Compact Size and Thin.
- Magnetically shielded against radiation.
- TPS1608DC used ceramic base with gold-plating.
- TPS3316DC and TPS5022DC used LCP plastic base.
- TPS3316DC and TPS5022DC designed for the higher current requirements of portable computers.
- TPS1608DC is specified to achieve longer battery life significantly in handheld communication devices.

Test Equipment :

- Electrical specifications at 25°C .
- Inductance (L): HP4284A LCR meter.
- Direct Current Resistance (DCR): Milli-ohm meter.

TPSDC Quick Reference :

- Electrical specifications at 25°C .
- TPS5022DC $10 \mu\text{H} \sim 1000 \mu\text{H}$; $3.9\text{A} \sim 0.53\text{A}$.
- TPS3316DC $1.0 \mu\text{H} \sim 1000 \mu\text{H}$; $5.0\text{A} \sim 0.17\text{A}$.
- TPS1608DC $1.0 \mu\text{H} \sim 10000 \mu\text{H}$; $3.0\text{A} \sim 0.02\text{A}$.
- Test equipment: L: HP4284A LCR meter; DCR: Milli-ohm meter.

Applications :

- DC-DC converter, PDA.
- Other Various Electronic Appliances.
- Notebook, Personal Computers, Cellular Phone.

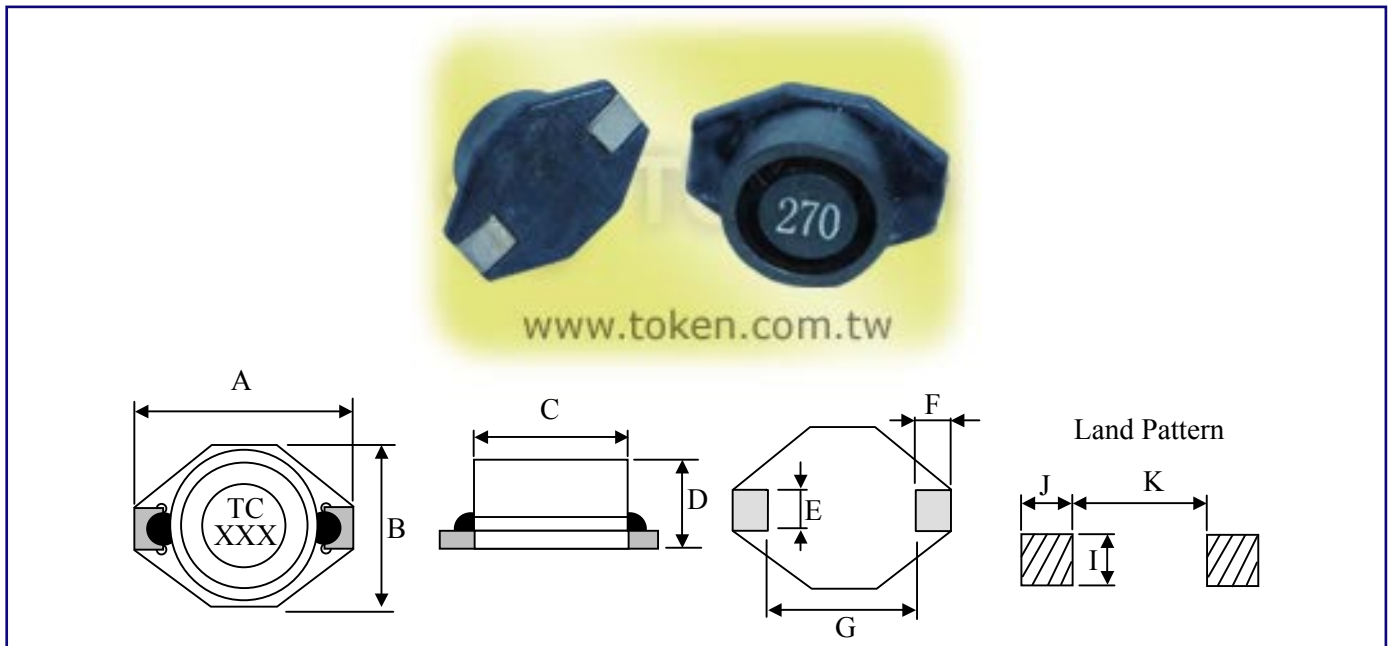
▶ (TPS1608DC) Dimensions & Configurations



| Type | A(max) | B(max) | C ± 0.3 | D(max) | E ± 0.3 | F ± 0.3 | G ± 0.3 | H ± 0.3 | I | J | K |
|-----------|--------|--------|---------|--------|---------|---------|---------|---------|------|------|------|
| TPS1608DC | 6.60 | 4.45 | 4.00 | 2.92 | 1.27 | 1.02 | 4.32 | 2.50 | 3.56 | 1.40 | 4.06 |

Note: Design as Customer's Requested Specifications.

▶ (TPS3316DC) Dimensions & Configurations



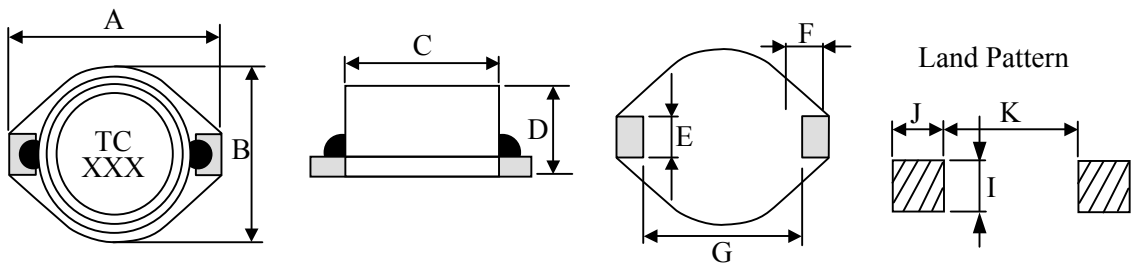
| Type | A(max) | B(max) | C ± 0.3 | D(max) | E ± 0.3 | F ± 0.3 | G ± 0.3 | I | J | K |
|-----------|--------|--------|---------|--------|---------|---------|---------|------|------|------|
| TPS3316DC | 12.95 | 9.40 | 8.38 | 5.08 | 2.54 | 2.54 | 7.62 | 2.79 | 2.92 | 7.37 |

Note: Design as Customer's Requested Specifications.

▶ (TPS5022DC) Dimensions & Configurations



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| Type | A(max) | B(max) | C ± 0.3 | D(max) | E ± 0.3 | F ± 0.3 | G ± 0.3 | I | J | K |
|-----------|--------|--------|---------|--------|---------|---------|---------|------|------|-------|
| TPS5022DC | 18.54 | 15.24 | 12.70 | 7.62 | 2.54 | 2.54 | 12.70 | 2.79 | 2.92 | 12.45 |

Note: Design as Customer's Requested Specifications.

▶ (TPS1608DC) Electrical Characteristics

| Part Number | Inductance (μH) | Tolerance | Test Condition | | DCR (Ω) (max) | SRF ref (MHz) | Q (min) | I rms (A) (max) |
|------------------|-----------------|-----------|----------------|--------------|------------------|------------------|------------|--------------------|
| | | | L | Q | | | | |
| TPS1608DC - 1R0M | 1.00 | M | 100KHz, 0.1V | 200KHz, 0.1V | 0.040 | 250 | 30 | 3.00 |
| TPS1608DC - 1R5M | 1.50 | M | 100KHz, 0.1V | 200KHz, 0.1V | 0.045 | 125 | 30 | 2.80 |
| TPS1608DC - 2R2M | 2.20 | M | 100KHz, 0.1V | 200KHz, 0.1V | 0.050 | 120 | 40 | 1.80 |
| TPS1608DC - 3R3M | 3.30 | M | 100KHz, 0.1V | 200KHz, 0.1V | 0.055 | 120 | 40 | 1.60 |
| TPS1608DC - 4R7M | 4.70 | M | 100KHz, 0.1V | 200KHz, 0.1V | 0.060 | 105 | 40 | 1.40 |
| TPS1608DC - 6R8M | 6.80 | M | 100KHz, 0.1V | 200KHz, 0.1V | 0.065 | 50 | 40 | 1.20 |
| TPS1608DC - 100M | 10.00 | M | 100KHz, 0.1V | 200KHz, 0.1V | 0.075 | 38 | 40 | 1.00 |
| TPS1608DC - 150M | 15.00 | M | 100KHz, 0.1V | 200KHz, 0.1V | 0.090 | 33 | 40 | 0.80 |
| TPS1608DC - 220M | 22.00 | M | 100KHz, 0.1V | 200KHz, 0.1V | 0.110 | 25 | 40 | 0.70 |
| TPS1608DC - 330M | 33.00 | M | 100KHz, 0.1V | 200KHz, 0.1V | 0.190 | 20 | 40 | 0.60 |
| TPS1608DC - 470M | 47.00 | M | 100KHz, 0.1V | 200KHz, 0.1V | 0.230 | 20 | 40 | 0.50 |
| TPS1608DC - 680M | 68.00 | M | 100KHz, 0.1V | 200KHz, 0.1V | 0.290 | 15 | 40 | 0.40 |
| TPS1608DC - 101M | 100.00 | K | 100KHz, 0.1V | 200KHz, 0.1V | 0.480 | 10 | 40 | 0.30 |
| TPS1608DC - 151M | 150.00 | K | 100KHz, 0.1V | 200KHz, 0.1V | 0.590 | 9 | 40 | 0.26 |
| TPS1608DC - 221M | 220.00 | K | 100KHz, 0.1V | 200KHz, 0.1V | 0.770 | 6 | 40 | 0.22 |
| TPS1608DC - 331M | 330.00 | K | 100KHz, 0.1V | 200KHz, 0.1V | 1.400 | 5 | 40 | 0.20 |
| TPS1608DC - 471M | 470.00 | K | 100KHz, 0.1V | 200KHz, 0.1V | 1.800 | 4 | 40 | 0.19 |
| TPS1608DC - 681M | 680.00 | K | 100KHz, 0.1V | 200KHz, 0.1V | 2.200 | 3 | 40 | 0.18 |
| TPS1608DC - 102M | 1000.00 | K | 100KHz, 0.1V | 200KHz, 0.1V | 3.400 | 2 | 40 | 0.15 |
| TPS1608DC - 152M | 1500.00 | K | 100KHz, 0.1V | 200KHz, 0.1V | 4.200 | 2 | 50 | 0.12 |
| TPS1608DC - 222M | 2200.00 | K | 100KHz, 0.1V | 200KHz, 0.1V | 8.500 | 2 | 50 | 0.10 |
| TPS1608DC - 332M | 3300.00 | K | 100KHz, 0.1V | 200KHz, 0.1V | 11.000 | 1 | 50 | 0.08 |
| TPS1608DC - 472M | 4700.00 | K | 100KHz, 0.1V | 200KHz, 0.1V | 13.900 | 1 | 50 | 0.06 |
| TPS1608DC - 682M | 6800.00 | K | 100KHz, 0.1V | 200KHz, 0.1V | 25.000 | 1 | 50 | 0.04 |
| TPS1608DC - 103M | 10000.00 | K | 100KHz, 0.1V | 200KHz, 0.1V | 32.800 | 0.8 | 50 | 0.02 |

Note: Test Freq.: 100KHz / 0.1V.

Current (max) 30°C temperature rise.

Operating Temp.: -40°C ~ +85°C.

▶ (TPS3316DC) Electrical Characteristics

| Part Number | Inductance (μH) | Tolerance | Test Condition | DCR (Ω) (max) | SRF ref (MHz) | IDC (A) (max) | I rms (A) (max) |
|------------------|-----------------|-----------|----------------|---------------|---------------|---------------|-----------------|
| TPS3316DC - 1R0M | 1.00 | M | 100KHz, 0.1V | 0.021 | 140 | 5.60 | 5.0 |
| TPS3316DC - 1R5M | 1.50 | M | 100KHz, 0.1V | 0.022 | 120 | 5.20 | 4.5 |
| TPS3316DC - 2R2M | 2.20 | M | 100KHz, 0.1V | 0.032 | 80 | 5.00 | 3.8 |
| TPS3316DC - 3R3M | 3.30 | M | 100KHz, 0.1V | 0.039 | 70 | 3.90 | 3.3 |
| TPS3316DC - 4R7M | 4.70 | M | 100KHz, 0.1V | 0.054 | 40 | 3.20 | 2.7 |
| TPS3316DC - 6R8M | 6.80 | M | 100KHz, 0.1V | 0.075 | 38 | 2.80 | 2.2 |
| TPS3316DC - 100M | 10.00 | M | 100KHz, 0.1V | 0.101 | 35 | 2.40 | 2.0 |
| TPS3316DC - 150M | 15.00 | M | 100KHz, 0.1V | 0.150 | 25 | 2.00 | 1.5 |
| TPS3316DC - 220M | 22.00 | M | 100KHz, 0.1V | 0.207 | 19 | 1.60 | 1.3 |
| TPS3316DC - 330M | 33.00 | M | 100KHz, 0.1V | 0.334 | 15 | 1.40 | 1.1 |
| TPS3316DC - 470M | 47.00 | M | 100KHz, 0.1V | 0.472 | 13 | 1.00 | 0.8 |
| TPS3316DC - 680M | 68.00 | M | 100KHz, 0.1V | 0.660 | 10 | 0.9 | 0.7 |
| TPS3316DC - 101M | 100.00 | M | 100KHz, 0.1V | 1.110 | 7 | 0.8 | 0.6 |
| TPS3316DC - 151M | 150.00 | M | 100KHz, 0.1V | 1.550 | 6 | 0.6 | 0.5 |
| TPS3316DC - 221M | 220.00 | M | 100KHz, 0.1V | 2.000 | 5 | 0.5 | 0.37 |
| TPS3316DC - 102M | 1000.00 | M | 100KHz, 0.1V | 8.300 | 2 | 0.32 | 0.17 |

Note: Test Freq.: 100KHz / 0.1V.

Operating Temp.: -40°C ~ +85°C.

Inductance drop=10% typ. at IDC.

▶ (TPS5022DC) Electrical Characteristics

| Part Number | Inductance (μH) | Tolerance | Test Condition | DCR (Ω) (max) | SRF ref (MHz) | IDC (A) (max) | I rms (A) (max) |
|------------------|-----------------|-----------|----------------|---------------|---------------|---------------|-----------------|
| TPS5022DC - 100M | 10.00 | M | 100KHz, 0.1V | 0.040 | 30 | 8.00 | 3.9 |
| TPS5022DC - 150M | 15.00 | M | 100KHz, 0.1V | 0.048 | 20 | 7.00 | 3.4 |
| TPS5022DC - 220M | 22.00 | M | 100KHz, 0.1V | 0.059 | 18 | 6.00 | 3.1 |
| TPS5022DC - 330M | 33.00 | M | 100KHz, 0.1V | 0.075 | 14 | 5.00 | 2.8 |
| TPS5022DC - 470M | 47.00 | M | 100KHz, 0.1V | 0.097 | 10 | 4.00 | 2.4 |
| TPS5022DC - 680M | 68.00 | M | 100KHz, 0.1V | 0.138 | 9.0 | 3.00 | 2.0 |
| TPS5022DC - 101M | 100.00 | M | 100KHz, 0.1V | 0.207 | 7.0 | 2.40 | 1.7 |
| TPS5022DC - 151M | 150.00 | M | 100KHz, 0.1V | 0.293 | 6.0 | 2.10 | 1.3 |
| TPS5022DC - 221M | 220.00 | M | 100KHz, 0.1V | 0.470 | 5.0 | 1.90 | 1.1 |
| TPS5022DC - 331M | 330.00 | M | 100KHz, 0.1V | 0.780 | 4.0 | 1.10 | 0.86 |
| TPS5022DC - 471M | 470.00 | M | 100KHz, 0.1V | 1.080 | 3.0 | 1.10 | 0.73 |
| TPS5022DC - 681M | 680.00 | M | 100KHz, 0.1V | 1.400 | 2.5 | 0.96 | 0.64 |
| TPS5022DC - 102M | 1000.00 | M | 100KHz, 0.1V | 2.010 | 2.0 | 0.80 | 0.53 |

Note: Test Freq.: 100KHz / 0.1V.

Operating Temp.: -40°C ~ +85°C.

Inductance drop=10% typ. at IDC.

▶ How to Order

TPS1608DC

❶

100

❷

M

❸

❶ Part Number: TPS1608DC, TPS3316DC, TPS5022DC

❷ Inductance

| Code | Inductance |
|------|------------|
| 1R0 | 1.00μH |
| 100 | 10.00μH |
| 101 | 100.00μH |

❸ Tolerance

| Code | Tolerance |
|------|-----------|
| K | 10% |
| L | 15% |
| M | 20% |
| N | 30% |

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