

# 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  $\mu\text{H}$  to 10000.00  $\mu\text{H}$ , resistance of 0.021 ohms to 32.800 ohms, and a rated current of 0.02A to 8.00A. The inductors also operate from  $-40^{\circ}\text{C}$  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 ( $I_{\text{rms}}$ ): 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  $25^{\circ}\text{C}$ .
- Inductance (L): HP4284A LCR meter.
- Direct Current Resistance (DCR): Milli-ohm meter.

### TPSDC Quick Reference :

- Electrical specifications at  $25^{\circ}\text{C}$ .
- 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.

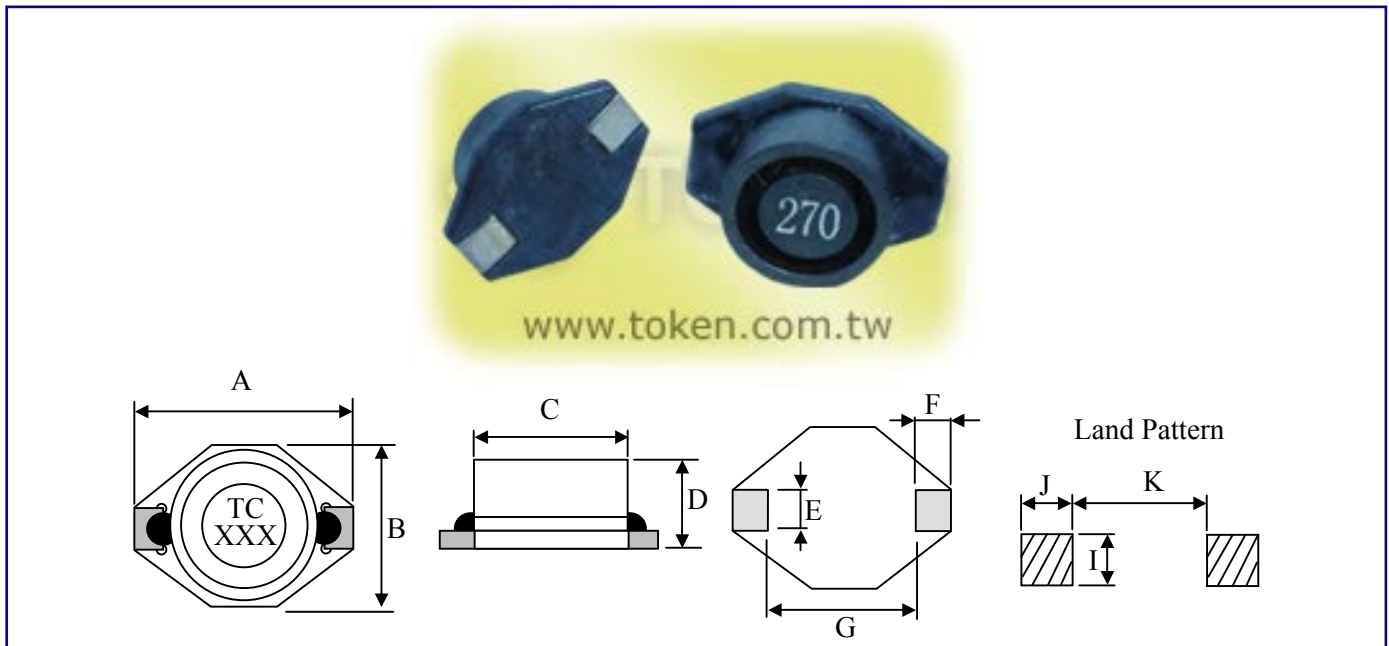
## ▶ (TPS1608DC) Dimensions & Configurations



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



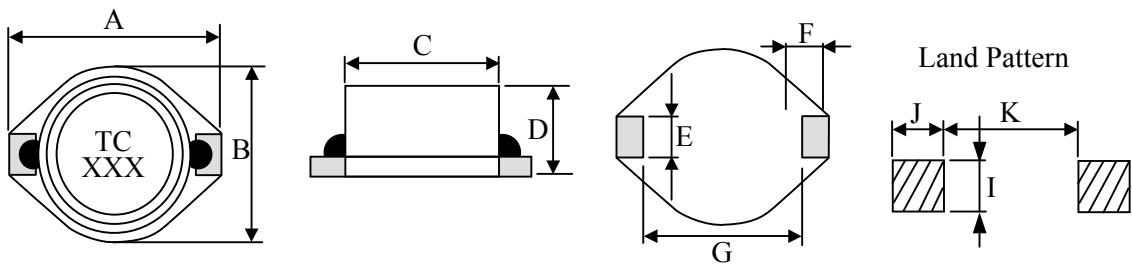
Type	A(max)	B(max)	C ± 0.3	D(max)	E ± 0.3	F ± 0.3	G ± 0.3	I	J	K
TPS3316DC	12.95	9.40	8.38	5.08	2.54	2.54	7.62	2.79	2.92	7.37

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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