

Inductors for Power Circuits

Wound/STD • magnetic shielded

VLCF series

Type:

- VLCF4018-2 (4.0x4.0 mm)**
- VLCF4020 (4.0x4.0 mm)**
- VLCF4024-2 (4.0x4.0 mm)**
- VLCF4028-2 (4.0x4.0 mm)**
- VLCF5020 (5.0x5.0 mm)**
- VLCF5020-1 (5.0x5.0 mm)**
- VLCF5020-3 (5.0x5.0 mm)**
- VLCF5024-2 (5.0x5.0 mm)**
- VLCF5028-2 (5.0x5.0 mm)**

Issue date: October 2012

- All specifications are subject to change without notice.
- Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

Inductors for Power Circuits

Wound/STD • Magnetic Shielded

Conformity to RoHS Directive

VLCF Series VLCF4018-2

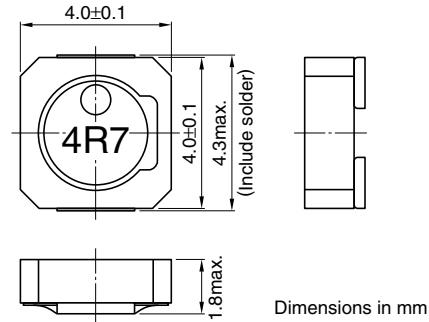
FEATURES

- Mount area: 4×4mm
Low profile: 1.8mm max. height
- Generic use for portable DC to DC converter line.
- High magnetic shield construction should actualize high resolution for EMC protection.
- Available for automatic mounting in tape and reel package.
- The products contain no lead and also support lead-free soldering.
- It is a product conforming to RoHS directive.

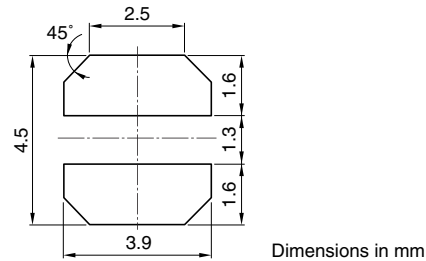
APPLICATIONS

Power source inductor for mobile devices such as mobile phones, HDDs, and DSCs

SHAPES AND DIMENSIONS



RECOMMENDED PC BOARD PATTERN



ELECTRICAL CHARACTERISTICS

Part No.	Inductance (μH)	Inductance tolerance(%)	Test frequency (kHz)	DC resistance(Ω)		Rated current(A)*	
				max.	typ.	Based on inductance change max.	Based on temperature rise typ.
VLCF4018T-1R6N1R7-2	1.6	±30	100	0.051	0.044	1.72	2.42
VLCF4018T-2R2N1R4-2	2.2	±30	100	0.06	0.052	1.44	2.23
VLCF4018T-3R3N1R2-2	3.3	±30	100	0.079	0.069	1.26	1.93
VLCF4018T-4R7N1R0-2	4.7	±30	100	0.101	0.088	1.07	1.72
VLCF4018T-6R8NR94-2	6.8	±30	100	0.124	0.108	0.94	1.55
VLCF4018T-100MR74-2	10	±20	100	0.188	0.163	0.74	1.26
VLCF4018T-150MR59-2	15	±20	100	0.268	0.233	0.59	1.1
VLCF4018T-220MR49-2	22	±20	100	0.369	0.321	0.49	0.9
VLCF4018T-330MR42-2	33	±20	100	0.54	0.469	0.42	0.74
VLCF4018T-470MR34-2	47	±20	100	0.76	0.661	0.34	0.62

* Rated current: Value obtained when current flows and the temperature has risen to 40°C or when DC current flows and the nominal value of inductance has fallen by 30%, whichever is smaller.

- Operating temperature range: -40 to +105°C (Including self-temperature rise)

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

• All specifications are subject to change without notice.

Inductors for Power Circuits

Wound/STD • Magnetic Shielded

Conformity to RoHS Directive

VLCF Series VLCF4020

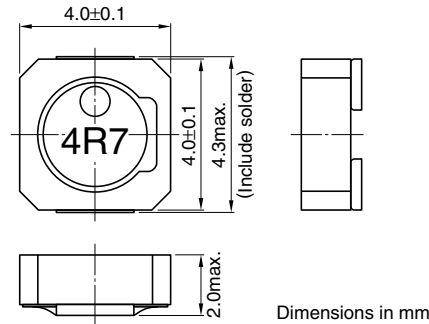
FEATURES

- Miniature size
Mount area: 4×4mm
Height: 2.0mm max.
- Generic use for portable DC to DC converter line
- High magnetic shield construction should actualize high resolution for EMC protection.
- Available for automatic mounting in tape and reel package.
- The products do not contain lead and support lead-free soldering.

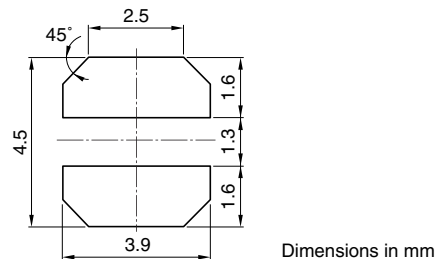
APPLICATIONS

DC to DC converters for DVC, DSC, PDA, MD, LCD displays, HDDs, etc.

SHAPES AND DIMENSIONS



RECOMMENDED PC BOARD PATTERN



ELECTRICAL CHARACTERISTICS

Part No.	Inductance (μH)	Inductance tolerance(%)	Test frequency (kHz)	DC resistance(Ω)		Rated current(A)*	
				max.	typ.	Based on inductance change max.	Based on temperature rise typ.
VLCF4020T-1R8N1R9	1.8	±30	100	0.051	0.046	1.97	2.37
VLCF4020T-2R2N1R7	2.2	±30	100	0.059	0.054	1.72	2.19
VLCF4020T-3R3N1R5	3.3	±30	100	0.078	0.071	1.52	1.94
VLCF4020T-4R7N1R2	4.7	±30	100	0.098	0.089	1.24	1.71
VLCF4020T-6R8N1R0	6.8	±30	100	0.131	0.119	1.05	1.47
VLCF4020T-100MR85	10	±20	100	0.185	0.168	0.85	1.22
VLCF4020T-150MR68	15	±20	100	0.303	0.275	0.68	1.0
VLCF4020T-220MR56	22	±20	100	0.431	0.391	0.56	0.8
VLCF4020T-270MR48	27	±20	100	0.496	0.451	0.48	0.8
VLCF4020T-330MR47	33	±20	100	0.628	0.571	0.47	0.69
VLCF4020T-470MR39	47	±20	100	0.934	0.849	0.39	0.56
VLCF4020T-101MR26	100	±20	100	1.4	1.308	0.26	0.45

* Rated current: Value obtained when current flows and the temperature has risen to 40°C or when DC current flows and the nominal value of inductance has fallen by 30%, whichever is smaller.

- Operating temperature range: -40 to +105°C (Including self-temperature rise)

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

• All specifications are subject to change without notice.

Inductors for Power Circuits

Wound/STD • Magnetic Shielded

Conformity to RoHS Directive

VLCF Series VLCF4024-2

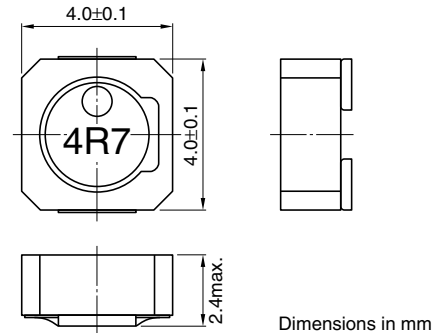
FEATURES

- Miniature size
Mount area: 4×4mm
Height: 2.4mm max.
- Generic use for portable DC to DC converter line
- High magnetic shield construction should actualize high resolution for EMC protection.
- Available for automatic mounting in tape and reel package.
- The products do not contain lead and support lead-free soldering.

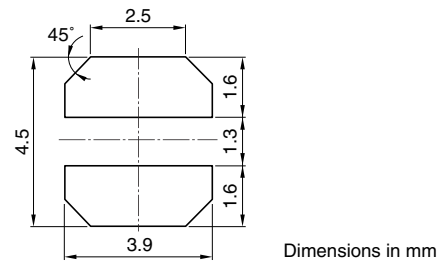
APPLICATIONS

DC to DC converters for DVC, DSC, PDA, MD, LCD displays, HDDs, cellular phones, etc.

SHAPES AND DIMENSIONS



RECOMMENDED PC BOARD PATTERN



ELECTRICAL CHARACTERISTICS

Part No.	Inductance (μH)	Inductance tolerance	Test frequency (kHz)	DC resistance(Ω)		Rated current(A)*	
				max.	typ.	Based on inductance change max.	Based on temperature rise typ.
VLCF4024T-1R2N2R4-2	1.2	±30%	100	0.032	0.027	2.46	3.09
VLCF4024T-1R6N2R1-2	1.6	±30%	100	0.039	0.035	2.10	2.61
VLCF4024T-2R2N1R7-2	2.2	±30%	100	0.043	0.039	1.76	2.43
VLCF4024T-3R3N1R6-2	3.3	±30%	100	0.068	0.061	1.60	1.96
VLCF4024T-4R7N1R4-2	4.7	±30%	100	0.087	0.075	1.43	1.76
VLCF4024T-6R8N1R1-2	6.8	±30%	100	0.116	0.101	1.15	1.54
VLCF4024T-100MR90-2	10	±20%	100	0.136	0.119	0.90	1.37
VLCF4024T-150MR80-2	15	±20%	100	0.198	0.172	0.80	1.05
VLCF4024T-220MR65-2	22	±20%	100	0.332	0.28	0.65	0.90
VLCF4024T-330MR55-2	33	±20%	100	0.438	0.38	0.55	0.74
VLCF4024T-470MR44-2	47	±20%	100	0.644	0.56	0.44	0.64
VLCF4024T-101MR30-2	100	±20%	100	1.21	1.05	0.30	0.48

* Rated current: Value obtained when current flows and the temperature has risen to 40°C or when DC current flows and the nominal value of inductance has fallen by 30%, whichever is smaller.

- Operating temperature range: -40 to +105°C (Including self-temperature rise)

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

• All specifications are subject to change without notice.

Inductors for Power Circuits

Wound/STD • Magnetic Shielded

Conformity to RoHS Directive

VLCF Series VLCF4028-2

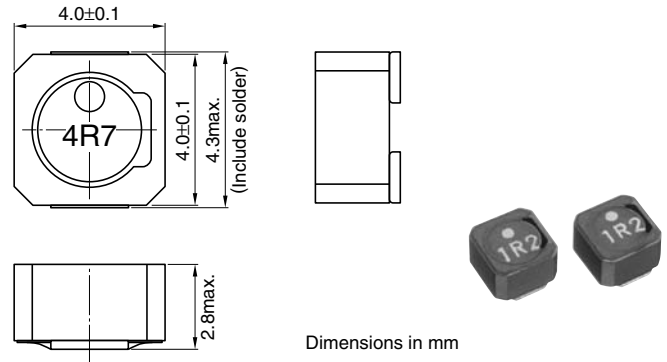
FEATURES

- Mount area: 4×4mm
Low profile: 2.8mm max. height
- Generic use for portable DC to DC converter line.
- High magnetic shield construction should actualize high resolution for EMC protection.
- Available for automatic mounting in tape and reel package.
- The products contain no lead and also support lead-free soldering.
- It is a product conforming to RoHS directive.

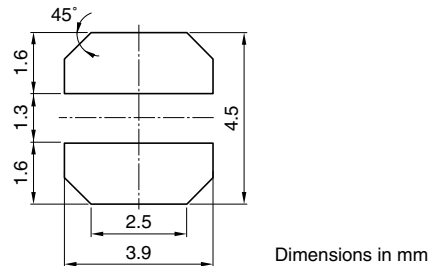
APPLICATIONS

Power source inductor for mobile devices such as mobile phones, HDDs, and DSCs

SHAPES AND DIMENSIONS



RECOMMENDED PC BOARD PATTERN



ELECTRICAL CHARACTERISTICS

Part No.	Inductance (μH)	Inductance tolerance(%)	Test frequency (kHz)	DC resistance(Ω)		Rated current(A)*	
				max.	typ.	Based on inductance change max.	Based on temperature rise typ.
VLCF4028T-1R2N2R7-2	1.2	±30	100	0.032	0.027	2.71	3.11
VLCF4028T-1R6N2R3-2	1.6	±30	100	0.038	0.032	2.31	2.85
VLCF4028T-2R2N1R9-2	2.2	±30	100	0.043	0.037	1.94	2.63
VLCF4028T-2R7N1R8-2	2.7	±30	100	0.049	0.043	1.89	2.46
VLCF4028T-4R7N1R5-2	4.7	±30	100	0.062	0.054	1.57	2.18
VLCF4028T-6R8N1R3-2	6.8	±30	100	0.1	0.09	1.36	1.69
VLCF4028T-100M1R0-2	10	±20	100	0.14	0.12	1.06	1.45
VLCF4028T-150MR88-2	15	±20	100	0.17	0.15	0.88	1.05
VLCF4028T-220MR72-2	22	±20	100	0.24	0.21	0.72	0.9
VLCF4028T-330MR61-2	33	±20	100	0.35	0.3	0.61	0.74
VLCF4028T-470MR48-2	47	±20	100	0.49	0.42	0.48	0.78
VLCF4028T-101MR33-2	100	±20	100	1	0.87	0.33	0.55
VLCF4028T-471MR14-2	470	±20	100	4.58	3.98	0.14	0.25

* Rated current: Value obtained when current flows and the temperature has risen to 40°C or when DC current flows and the nominal value of inductance has fallen by 30%, whichever is smaller.

- Operating temperature range: -40 to +105°C (Including self-temperature rise)

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

• All specifications are subject to change without notice.

Inductors for Power Circuits

Wound/STD • Magnetic Shielded

Conformity to RoHS Directive

VLCF Series VLCF5020

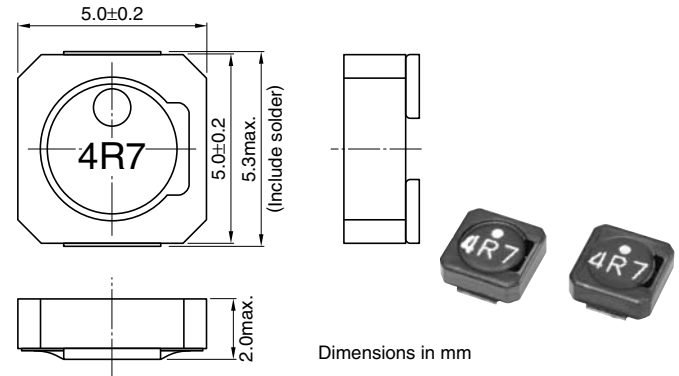
FEATURES

- Miniature size
Mount area: 5×5mm
Height: 2.0mm max.
- Generic use for portable DC to DC converter line
- High magnetic shield construction should actualize high resolution for EMC protection.
- Available for automatic mounting in tape and reel package.
- The products do not contain lead and support lead-free soldering.

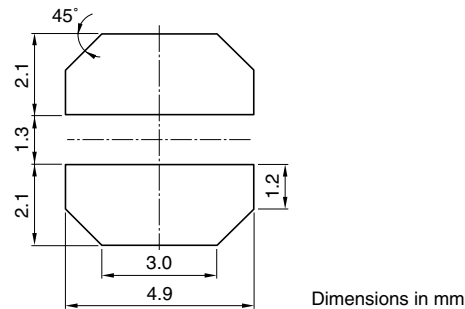
APPLICATIONS

DC to DC converters for DVC, DSC, PDA, MD, LCD displays, HDDs, etc.

SHAPES AND DIMENSIONS



RECOMMENDED PC BOARD PATTERN



ELECTRICAL CHARACTERISTICS

Part No.	Inductance (μH)	Inductance tolerance	Test frequency (kHz)	DC resistance(Ω)		Rated current(A)*	
				max.	typ.	Based on inductance change max.	Based on temperature rise typ.
VLCF5020T-1R8N2R0	1.8	±30%	100	0.059	0.049	2.07	2.75
VLCF5020T-2R7N1R7	2.7	±30%	100	0.071	0.058	1.76	2.51
VLCF5020T-3R3N1R6	3.3	±30%	100	0.083	0.069	1.6	2.31
VLCF5020T-4R7N1R4	4.7	±30%	100	0.096	0.079	1.4	2.15
VLCF5020T-6R8N1R1	6.8	±30%	100	0.122	0.102	1.11	1.9
VLCF5020T-100MR87	10	±20%	100	0.182	0.151	0.87	1.56
VLCF5020T-150MR71	15	±20%	100	0.256	0.214	0.71	1.3
VLCF5020T-220MR58	22	±20%	100	0.373	0.311	0.58	1.1
VLCF5020T-330MR48	33	±20%	100	0.522	0.435	0.48	0.92
VLCF5020T-470MR40	47	±20%	100	0.748	0.623	0.40	0.77
VLCF5020T-101MR27	100	±20%	100	1.581	1.375	0.27	0.52

* Rated current: Value obtained when current flows and the temperature has risen to 40°C or when DC current flows and the nominal value of inductance has fallen by 30%, whichever is smaller.

- Operating temperature range: -40 to +105°C (Including self-temperature rise)

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

• All specifications are subject to change without notice.

Inductors for Power Circuits

Wound/STD • Magnetic Shielded

Conformity to RoHS Directive

VLCF Series VLCF5020-1

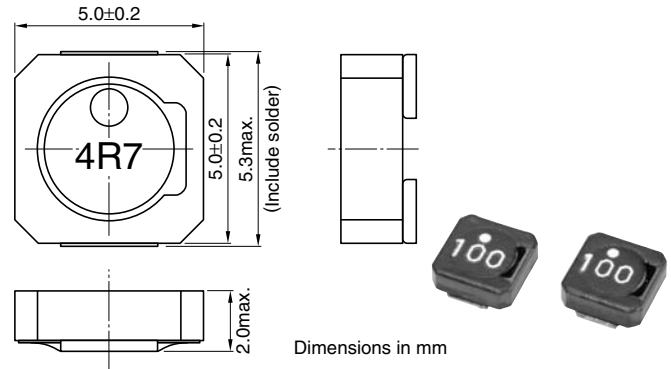
FEATURES

- Miniature size
Mount area: 5×5mm
Height: 2.0mm max.
- Generic use for portable DC to DC converter line
- High magnetic shield construction should actualize high resolution for EMC protection.
- Available for automatic mounting in tape and reel package.
- The products do not contain lead and support lead-free soldering.

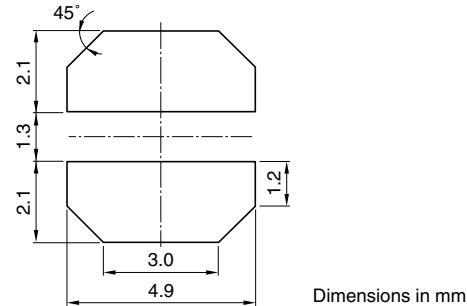
APPLICATIONS

DC to DC converters for DVC, DSC, PDA, MD, LCD displays, HDDs, etc.

SHAPES AND DIMENSIONS



RECOMMENDED PC BOARD PATTERN



ELECTRICAL CHARACTERISTICS

Part No.	Inductance (μH)	Inductance tolerance	Test frequency (kHz)	DC resistance(Ω)		Rated current(A)*	
				max.	typ.	Based on inductance change max.	Based on temperature rise typ.
VLCF5020T-2R2N2R6-1	2.2	±30%	100	0.071	0.058	2.62	2.76
VLCF5020T-2R7N2R2-1	2.7	±30%	100	0.083	0.069	2.28	2.55
VLCF5020T-3R3N2R0-1	3.3	±30%	100	0.096	0.079	2.02	2.37
VLCF5020T-4R7N1R7-1	4.7	±30%	100	0.122	0.102	1.7	2.09
VLCF5020T-6R8N1R3-1	6.8	±30%	100	0.165	0.138	1.39	1.8
VLCF5020T-100M1R1-1	10	±20%	100	0.237	0.198	1.13	1.5
VLCF5020T-150MR90-1	15	±20%	100	0.35	0.292	0.90	1.2
VLCF5020T-220MR75-1	22	±20%	100	0.496	0.413	0.75	1.0
VLCF5020T-330MR62-1	33	±20%	100	0.717	0.597	0.62	0.86
VLCF5020T-470MR51-1	47	±20%	100	1.05	0.875	0.51	0.71

* Rated current: Value obtained when current flows and the temperature has risen to 40°C or when DC current flows and the nominal value of inductance has fallen by 30%, whichever is smaller.

- Operating temperature range: -40 to +105°C (Including self-temperature rise)

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

• All specifications are subject to change without notice.

Inductors for Power Circuits

Wound/STD • Magnetic Shielded

Conformity to RoHS Directive

VLCF Series VLCF5020-3

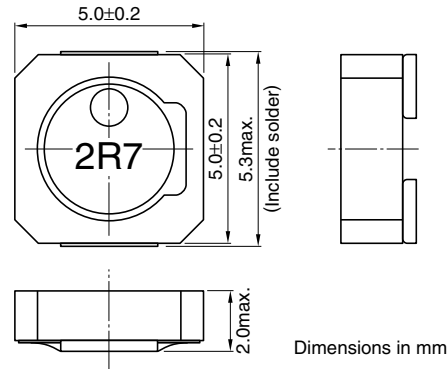
FEATURES

- Miniature size
Mount area: 5×5mm
Height: 2.0mm max.
- Generic use for portable DC to DC converter line
- High magnetic shield construction should actualize high resolution for EMC protection.
- Available for automatic mounting in tape and reel package.
- The products contain no lead and also support lead-free soldering.

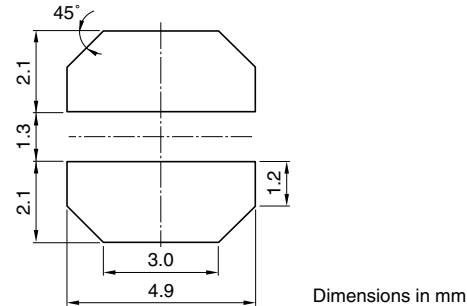
APPLICATIONS

DC to DC converters for DVC, DSC, PDA, MD, LCD displays, HDDs, cellular phones, etc.

SHAPES AND DIMENSIONS



RECOMMENDED PC BOARD PATTERN



ELECTRICAL CHARACTERISTICS

Part No.	Inductance (μH)	Inductance tolerance	Test frequency (kHz)	DC resistance(Ω)		Rated current(A)*	
				max.	typ.	Based on inductance change max.	Based on temperature rise typ.
VLCF5020T-2R2N2R6-3	2.2	±30%	100	0.043	0.038	2.62	3.25
VLCF5020T-2R7N2R2-3	2.7	±30%	100	0.054	0.046	2.28	2.98
VLCF5020T-3R3N2R0-3	3.3	±30%	100	0.065	0.055	2.02	2.76

* Rated current: Value obtained when current flows and the temperature has risen to 40°C or when DC current flows and the nominal value of inductance has fallen by 30%, whichever is smaller.

- Operating temperature range: -40 to +105°C (Including self-temperature rise)

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

• All specifications are subject to change without notice.

Inductors for Power Circuits

Wound/STD • Magnetic Shielded

Conformity to RoHS Directive

VLCF Series VLCF5024-2

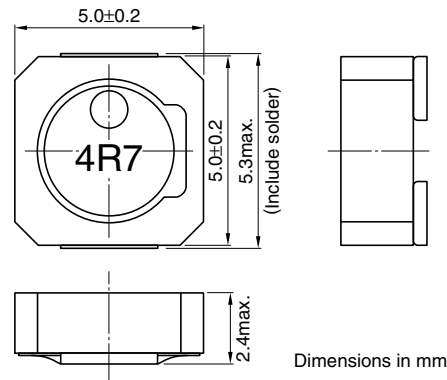
FEATURES

- Miniature size
Mount area: 5×5mm
Height: 2.4mm max.
- Generic use for portable DC to DC converter line
- High magnetic shield construction should actualize high resolution for EMC protection.
- Available for automatic mounting in tape and reel package.
- The products do not contain lead and support lead-free soldering.

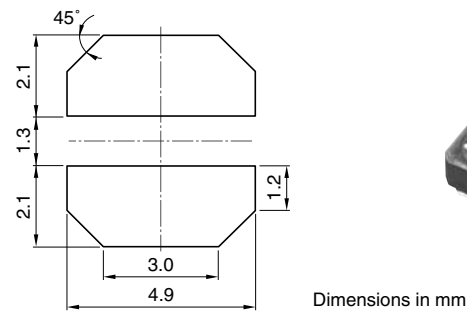
APPLICATIONS

DC to DC converters for DVC, DSC, PDA, MD, LCD displays, HDDs, etc.

SHAPES AND DIMENSIONS



RECOMMENDED PC BOARD PATTERN



ELECTRICAL CHARACTERISTICS

Part No.	Inductance (μH)	Inductance tolerance	Test frequency (kHz)	DC resistance(Ω)		Rated current(A)*	
				max.	typ.	Based on inductance change max.	Based on temperature rise typ.
VLCF5024T-1R8N1R8-2	1.8	±30%	100	0.026	0.022	1.86	4.05
VLCF5024T-2R7N1R5-2	2.7	±30%	100	0.031	0.027	1.53	3.67
VLCF5024T-3R3N1R4-2	3.3	±30%	100	0.037	0.032	1.46	3.37
VLCF5024T-4R7N1R3-2	4.7	±30%	100	0.044	0.038	1.33	3.11
VLCF5024T-6R8N1R1-2	6.8	±30%	100	0.061	0.053	1.11	2.62
VLCF5024T-100MR88-2	10	±20%	100	0.092	0.080	0.88	2.14
VLCF5024T-150MR71-2	15	±20%	100	0.152	0.133	0.71	1.66
VLCF5024T-220MR59-2	22	±20%	100	0.188	0.164	0.59	1.50
VLCF5024T-330MR50-2	33	±20%	100	0.275	0.239	0.50	1.24
VLCF5024T-470MR40-2	47	±20%	100	0.383	0.333	0.40	1.05
VLCF5024T-101MR28-2	100	±20%	100	0.838	0.762	0.28	0.72

* Rated current: Value obtained when current flows and the temperature has risen to 40°C or when DC current flows and the nominal value of inductance has fallen by 30%, whichever is smaller.

- Operating temperature range: -40 to +105°C (Including self-temperature rise)

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

• All specifications are subject to change without notice.

Inductors for Power Circuits

Wound/STD • Magnetic Shielded

Conformity to RoHS Directive

VLCF Series VLCF5028-2

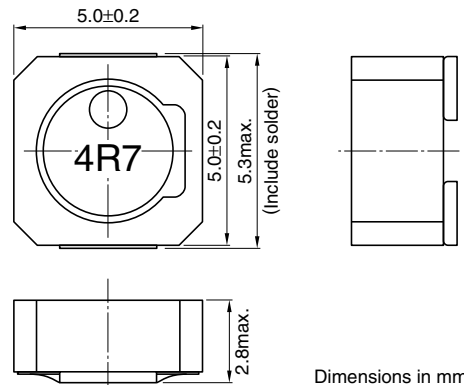
FEATURES

- Miniature size
Mount area: 5×5mm
Height: 2.8mm max.
- Generic use for portable DC to DC converter line.
- High magnetic shield construction should actualize high resolution for EMC protection.
- Available for automatic mounting in tape and reel package.
- The products do not contain lead and support lead-free soldering.

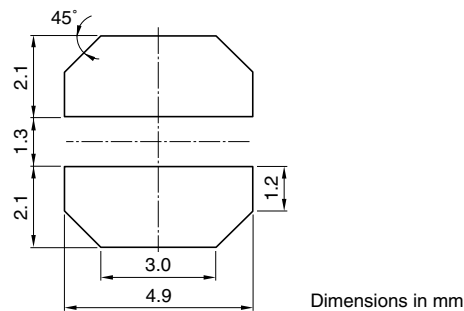
APPLICATIONS

DC to DC converters for DVCs, DSCs, PDAs, MDs, LCD displays, HDDs, etc.

SHAPES AND DIMENSIONS



RECOMMENDED PC BOARD PATTERN



ELECTRICAL CHARACTERISTICS

Part No.	Inductance (μH)	Inductance tolerance(%)	Test frequency (kHz)	DC resistance(Ω)		Rated current(A)*	
				max.	typ.	Based on inductance change max.	Based on temperature rise typ.
VLCF5028T-1R3N2R5-2	1.3	±30	100	0.022	0.019	2.56	4.32
VLCF5028T-1R8N2R2-2	1.8	±30	100	0.028	0.023	2.22	3.88
VLCF5028T-2R7N1R8-2	2.7	±30	100	0.033	0.028	1.82	3.53
VLCF5028T-3R3N1R7-2	3.3	±30	100	0.037	0.032	1.74	3.26
VLCF5028T-4R7N1R5-2	4.7	±30	100	0.043	0.038	1.58	3.03
VLCF5028T-6R8N1R3-2	6.8	±30	100	0.056	0.048	1.32	2.67
VLCF5028T-100M1R0-2	10	±20	100	0.083	0.072	1.05	2.19
VLCF5028T-150MR85-2	15	±20	100	0.12	0.1	0.85	1.85
VLCF5028T-220MR71-2	22	±20	100	0.14	0.13	0.71	1.66
VLCF5028T-330MR62-2	33	±20	100	0.24	0.21	0.62	1.3
VLCF5028T-470MR49-2	47	±20	100	0.33	0.29	0.49	1.1
VLCF5028T-560MR43-2	56	±20	100	0.41	0.36	0.43	0.98
VLCF5028T-680MR40-2	68	±20	100	0.46	0.4	0.4	0.93
VLCF5028T-101MR33-2	100	±20	100	0.67	0.58	0.33	0.77
VLCF5028T-221MR22-2	220	±20	100	1.38	1.2	0.22	0.54
VLCF5028T-471MR14-2	470	±20	100	3.12	2.71	0.14	0.35

* Rated current: Value obtained when current flows and the temperature has risen to 40°C or when DC current flows and the nominal value of inductance has fallen by 30%, whichever is smaller.

- Operating temperature range: -40 to +105°C (Including self-temperature rise)

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

• All specifications are subject to change without notice.

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9