

FEATURES 特征

- Adopts magnetic powder surface insulation and spray-free coating technology with excellent heat dissipation.
磁粉表面绝缘处理，采用免喷涂包覆工艺，散热性能优异
- Ultra-low DCR combined with high Q factor reduces power loop loss and improves conversion efficiency.
超低 DCR 搭配高 Q 值，降低电源回路损耗，提升转换效率
- Compact size to save PCB layout space.
体积小，节省 PCB 布线空间
- Operating Temp : -40℃~+125℃(Including self heating)
工作温度范围:-40℃~+125℃(包括自身温度上升)



APPLICATIONS 用途

- DC-DC converter circuits for smart wearables, modules and other various device.
适用于智能穿戴、模组等各类设备的 DC-DC 转换电路

PART NUMBERING 产品型号

AFL	160808	-	1R0	M	L	C
①	②		③	④	⑤	⑥

① Series Name	
AFL	Chip Power Inductors

② External Dimensions [LxWxT mm]	
100506	1.0×0.5×0.6
100508	1.0×0.5×0.8
160808	1.6×0.8×0.8

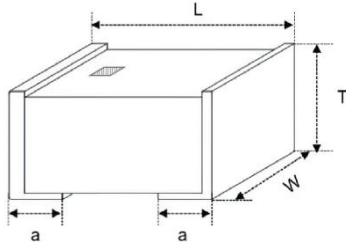
③ Inductance	
Code (example)	Nominal inductance [μH]
R47	0.47
1R0	1.0
2R2	2.2

④ Inductance Tolerance	
M	±20%
N	±30%

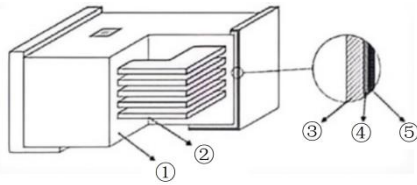
⑤ Internal Code	
	L

⑥ Category	
Routine	C
High Current	H
Special	P

■ APPEARANCE AND DIMENSIONS 外观与尺寸



Dimensions[mm]				
Series	L	W	T Max.	a
AFL100506	1.0±0.2	0.5±0.2	0.60	0.25±0.15
AFL100508	1.0±0.2	0.5±0.2	0.80	0.25±0.15
AFL160808	1.6±0.2	0.8±0.2	0.80	0.40±0.20



	Name	Material
1	Chip body	Metal magnetics
2	Internal coil	Ag
3	Terminal Electrodes (Base)	Ag
4	Terminal Electrodes (Plating)	Ni
5	Terminal Electrodes (Surface)	Sn

■ ELECTRICAL CHARACTERISTICS 特性规格表

● AFL1005xx Series

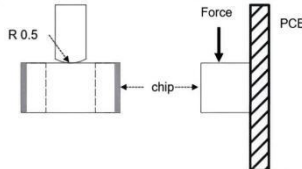
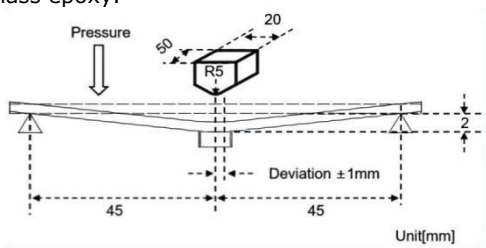
Part Number	Inductance	Inductance Tolerance	DC Resistance		Saturation Current		Heat Rating Current	
	@1MHz,0.5V		Max.	Typ.	Max.	Typ.	Max.	Typ.
Units	μH	M=±20% N=±30%	mΩ		A		A	
Symbol	L		DCR		Isat		Irms	
AFL100506-R47□LH	0.47	M/N	140	114	1.2	1.4	1.2	1.3
AFL100506-1R0□LH	1.0	M/N	300	250	1.0	1.2	0.8	0.9
AFL100508-2R2□LH	2.2	M/N	560	470	0.7	0.9	0.6	0.8

● AFL160808 Series

Part Number	Inductance	Inductance Tolerance	DC Resistance		Saturation Current		Heat Rating Current	
	@1MHz,0.5V		Max.	Typ.	Max.	Typ.	Max.	Typ.
Units	μH	M=±20% N=±30%	mΩ		A		A	
Symbol	L		DCR		Isat		Irms	
AFL160808-1R0□LH	1.0	M/N	110	89	2.2	2.5	1.6	1.9
AFL160808-1R0□LC	1.0	M/N	170	140	1.8	2.2	1.2	1.4
AFL160808-2R2□LH	2.2	M/N	270	220	1.3	1.6	1.3	1.4
AFL160808-2R2□LC	2.2	M/N	420	350	1.0	1.3	0.8	1.1
AFL160808-2R2□LP	2.2	M/N	250	210	1.5	1.8	1.4	1.5

- All test data is referenced to 25℃ ambient.
- The saturation current value (Isat) is the maximum DC current value at which the inductance decreases down to 30% (at 20℃).
- The temperature rise current value (Irms) is the maximum DC current value at which the temperature increases up to 40℃(at 20℃).
- The rated current value follows either Isat or Irms, whichever is lower.
- Absolute maximum voltage: 10V.

RELIABILITY TEST 可靠性测试

Items	Requirements	Test Methods and Remarks															
Terminal Strength	No significant mechanical damage or no sign of electrode peeling off shall be observed.	Test samples shall be soldered to test boards. A force shall be applied in vertically downward direction with a R 0.5 fixture for 10 seconds.  <table><tr><th>Type</th><th>Force</th></tr><tr><td>AFL100506</td><td>5N</td></tr><tr><td>AFL100508</td><td>5N</td></tr><tr><td>AFL160808-H</td><td>10N</td></tr><tr><td>AFL160808-C</td><td>5N</td></tr></table>	Type	Force	AFL100506	5N	AFL100508	5N	AFL160808-H	10N	AFL160808-C	5N					
Type	Force																
AFL100506	5N																
AFL100508	5N																
AFL160808-H	10N																
AFL160808-C	5N																
Bending Strength	No significant mechanical damage or no sign of electrode peeling off shall be observed.	Test samples shall be soldered to test boards. A force shall be applied in a downward direction until amount of deflection reaches 2mm. Test board dimension: 100×40×0.8mm Test board material: Glass epoxy.  Unit[mm]															
Vibration	Appearance shall have no significant mechanical damage. Inductance change rate: within ±10%.	Test samples shall be vibrated under the following conditions: - Frequency range: 10Hz to 55Hz - Overall amplitude: 1.5mm - Sweeping method: 10Hz - 55Hz - 10Hz for 1 minute - 2 hours each in X, Y, Z directions: 6 hours in total.															
Solderability	90% or more of the outer electrode shall be covered with new solder seamlessly.	Test samples shall be immersed into flux. Test samples shall be immersed into molten solder under the conditions shown in the tables below, then taken out and checked visually. The speed of immersion and taking out shall be 25mm/s. <table><tr><th>Solder</th><th>Sn/3.0Ag/0.5Cu</th></tr><tr><td>Solder temperature</td><td>245℃±5℃</td></tr><tr><td>Immersion time</td><td>4s±1s</td></tr></table>	Solder	Sn/3.0Ag/0.5Cu	Solder temperature	245℃±5℃	Immersion time	4s±1s									
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Solder temperature	245℃±5℃																
Immersion time	4s±1s																
Resistance to soldering heat	Appearance: No significant mechanical damage shall be observed. Inductance change rate: within ±10%.	Test samples shall be immersed into flux. Preheating as shown in the table below shall be conducted. Test samples shall be immersed into molten solder under the conditions shown in the table below and taken out. The speed of immersion and taking out shall be 25mm/s. Test samples shall be kept at ambient temperature for 2 or 3 hours (See Note 1) before measurement. <table><tr><th>Preheating</th><th>150℃,3min</th></tr><tr><td>Solder temperature</td><td>260℃±5℃</td></tr><tr><td>Immersion time</td><td>10s±1s</td></tr></table>	Preheating	150℃,3min	Solder temperature	260℃±5℃	Immersion time	10s±1s									
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Solder temperature	260℃±5℃																
Immersion time	10s±1s																
Thermal Shock	Appearance: No significant mechanical damage shall be observed. Inductance change rate: within ±10%.	Test samples shall be exposed to steps 1 to 4 shown in the table below as one cycle. The test should be repeated for 100 times. Test samples shall be kept at normal temperature and normal humidity for 2 to 3 hours before measurement. <table><tr><th>Step</th><th>Temperature</th><th>Time</th></tr><tr><td>1</td><td>-40℃⁺⁰₋₃℃</td><td>30min.±3min.</td></tr><tr><td>2</td><td>Normal temp.</td><td>2min. To 3min.</td></tr><tr><td>3</td><td>+85℃⁺³₋₀℃</td><td>30min.±3min.</td></tr><tr><td>4</td><td>Normal temp.</td><td>2min. To 3min.</td></tr></table>	Step	Temperature	Time	1	-40℃ ⁺⁰ ₋₃ ℃	30min.±3min.	2	Normal temp.	2min. To 3min.	3	+85℃ ⁺³ ₋₀ ℃	30min.±3min.	4	Normal temp.	2min. To 3min.
Step	Temperature	Time															
1	-40℃ ⁺⁰ ₋₃ ℃	30min.±3min.															
2	Normal temp.	2min. To 3min.															
3	+85℃ ⁺³ ₋₀ ℃	30min.±3min.															
4	Normal temp.	2min. To 3min.															

RELIABILITY TEST 可靠性测试

Items	Requirements	Test Methods and Remarks
Resistance to Humidity	Appearance: No significant mechanical damage shall be observed. Inductance change rate: within $\pm 10\%$.	Test samples shall be kept in an atmosphere at temperature and humidity of $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and 90 to 95%RH for 500 +24/-0 hours. Test samples shall be kept at normal temperature and normal humidity for 2 to 3 hours before measurement. (See Note 1)
High Temperature Load Life Test	Appearance: No significant mechanical damage shall be observed. Inductance change rate: within $\pm 10\%$.	Test samples shall be kept in an atmosphere at temperature of $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 500 +24/-0 hours while the rated current ($I_{\text{rms(max)}}$) is continuously applied. Test samples shall be kept at normal temperature and normal humidity for 2 to 3 hours before measurement. (See Note 1)
Humidity Resistance Load Life Test	Appearance: No significant mechanical damage shall be observed. Inductance change rate: within $\pm 10\%$.	Test samples shall be kept in an atmosphere at temperature and humidity of $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and 90 to 95%RH for 500 +24/-0 hours while the rated current ($I_{\text{rms(max)}}$) is continuously applied. Test samples shall be kept at normal temperature and normal humidity for 2 to 3 hours before measurement. (See Note 1)

- Note 1: If any doubt arises in the result of measurement, another measurement shall be conducted after leaving test samples to stand for 48 $\pm$ 2 hours.

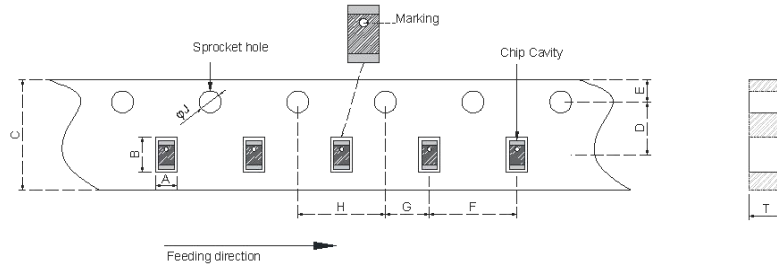
SPECIFICATION OF PACKAGING 包装规格

Taping specifications

Type	Packing quantity (Standard quantity)
AFL1005	10000/reel
AFL1608	4000/reel

Appearance and dimensions of tape

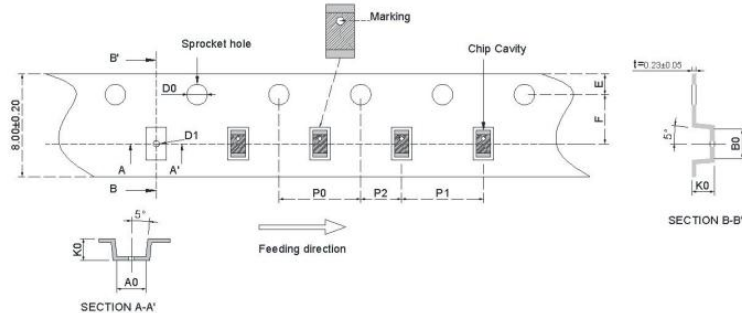
☆ AFL1005xx size



Type	Unit[mm]									
	A	B	C	D	E	F	G	H	J	T
AFL100506	±0.1	±0.1	±0.2	±0.05	±0.1	±0.05	±0.05	±0.1	±0.1	Max
AFL100508	0.8	1.3	8.0	3.5	1.75	2.0	2.0	4.0	1.5	0.65
	0.8	1.3	8.0	3.5	1.75	2.0	2.0	4.0	1.5	0.90

● A, B, T: Sufficient clearance

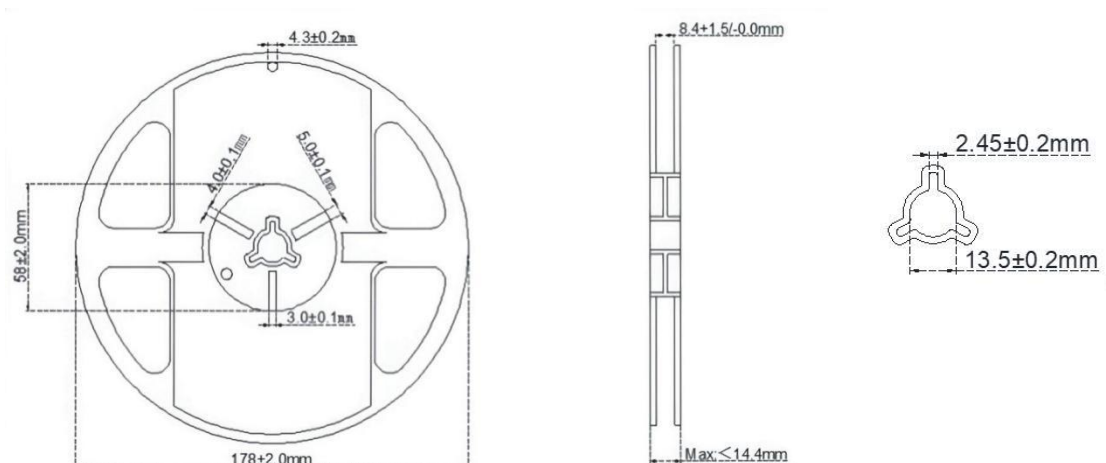
☆ AFL160808 size



Type	Unit[mm]									
	A0	B0	K0	P0	P1	P2	D0	D1	E	F
AFL160808	±0.1	±0.1	±0.1	±0.05	±0.1	±0.05	±0.1	±0.1	±0.1	±0.05
	1.02	2.06	0.88	4.0	4.0	2.0	1.5	0.5	1.75	3.5

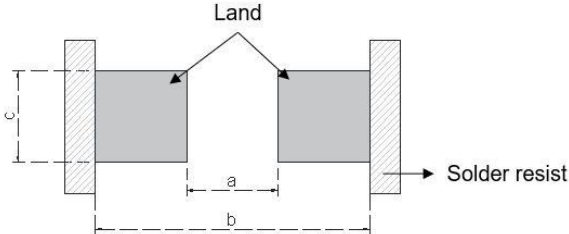
● A0, B0, K0: Sufficient clearance

● Reel Dimensions(Unit: mm)



RECOMMENDED SOLDERING TECHNOLOGIES 回流焊建议

Recommended pad dimensions for reflow soldering



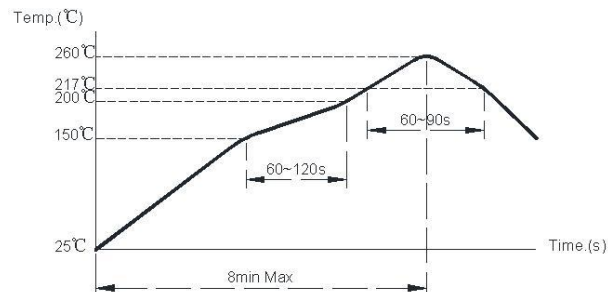
Series	a	b	c
AFL100506	0.50	1.30	0.70
AFL100508	0.50	1.30	0.70
AFL160808	1.00	1.90	1.00

Flux and solder used

- ☆ 1. Use a rosin-based flux.
- ☆ 2. Do not use a highly acidic flux with a halide content exceeding 0.2(wt)% (chlorine conversion value).
- ☆ 3. Do not use a water-soluble flux.
- ☆ 4. Use Sn-3.0Ag-0.5Cu solder.
- ☆ 5. Standard thickness of solder paste: 100 μm to 150 μm

Soldering conditions (reflow)

	Profile
Pre-heating	150°C to 180°C 90s±30s
Heating	Above 217°C 60s to 90s
Max temp	260°C
Number of reflow cycles	2 times



Reworking with soldering iron

Item	Requirement
Pre-heating	150°C/approx. 1 min
Tip temperature of soldering iron	350°C max.
Power consumption of soldering iron	80 W max.
Tip diameter of soldering iron	ø3 mm max
Soldering time	3 s (+1 s, -0 s)
Number of reworking operations	2 times max.

- ☆ Avoid touching the tip of the soldering iron directly to the chip, as this operation may crack the chip due to thermal stress.

■ PRECAUTIONS 注意事项

- Recommended pad dimensions for reflow soldering
- ☆ 1.Pre-heating should be in such a way that the temperature difference between solder and product surface is limited to 150℃ max.
- ☆ 2.Cooling into solvent after soldering also should be in such a way that the temperature difference is limited to 100℃ max.
- ☆ 3.Insufficient pre-heating may cause cracks on the product, resulting in the deterioration of product quality.
- ☆ 4.Do not perform reworking with a soldering iron on this product.
- ☆ 5.Avoid ultrasonic processing, which may cause component falling off and poor pad contact.
- ☆ 6.When using APV products, customers should record the production batch number for traceability.

SAFETY REMINDERS

● All products listed in this specification are developed, designed and intended for use in general electronics equipment. The products are not designed or Warranted to meet the requirements of the applications listed below, whose performance and/or quality require especially high reliability, or whose failure, malfunction or trouble might directly cause damage to society, person, or property. Please understand that we are not responsible for any damage or liability caused by use of the products in any of the applications below. Please contact us for more details if you intend to use our products in the following applications.

- ☆ 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.