FEATURES

- Various high power inductors are superior to be high saturation.
- Suitable for surface mounting equipment.
- Takes up less PCB real estate and save more power.
- Closed magnetic circuit design reduces leakage flux and Electro Magnetic Interference.
- Magnetic-resin shielded construction reduces buzz noise to ultra-low levels.
- Operating Temp：-40℃~+125℃(Including self heating).



APPLICATIONS

- Smart phone, set top box, VR, AR.
- Notebooks, desktop computers, servers.
- Portable gaming devices, personal navigation systems, personal multimedia devices.

PART NUMBERING

ANRL	201610	-	2R2	M
①	②		③	④

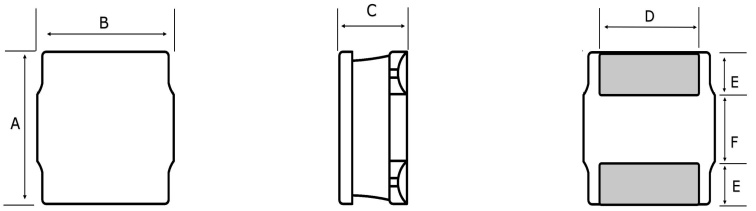
① Series Name	
ANRL	Wire Wound SMD Power Inductors

② External Dimensions [LxWxH mm]	
201610	2.0×1.6×1.0
252010	2.5×2.0×1.0
252012	2.5×2.0×1.2

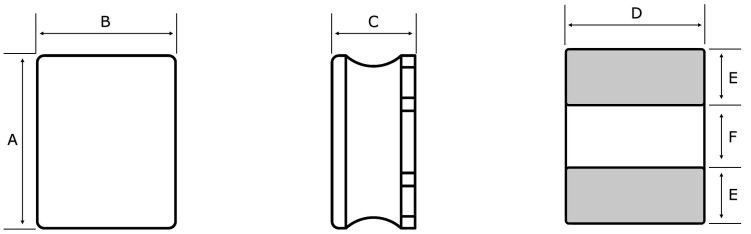
③ Nominal Inductance	
Code (example)	Nominal Inductance［μH］
R47	0.47
1R0	1.0
100	10

④ Inductance Tolerance	
M	±20%
N	±30%

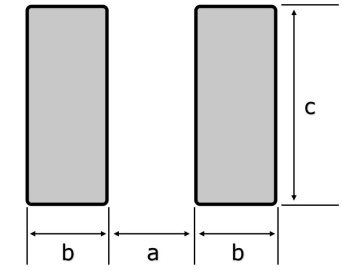
DIMENSIONS & RECOMMENDED LAND PATTERN



Series：ANRL201610



Series：ANRL252010~252012



Recommended Land Pattern

Unit: mm

Series	Dimensions						Recommended Land Pattern		
	A	B	C	D	E	F	a	b	c
	±0.3	±0.3	Max.	Typ.					
ANRL201610	2.00	1.60	1.05	1.20	0.60	0.80	0.60	0.80	1.60
ANRL252010	2.50	2.00	1.00	2.00	0.75	0.95	0.80	0.90	2.10
ANRL252012	2.50	2.00	1.20	2.00	0.75	0.95	0.80	0.90	2.10

ELECTRICAL CHARACTERISTICS

● ANRL201610 Series

Part Number	Inductance	Inductance Tolerance	DC Resistance	Heat Rating Current		Saturation Current	
	@100kHz,1V		Max.	Max.	Typ.	Max.	Typ.
Units	μH	M=±20%	Ω	A		A	
Symbol	L	N=±30%	DCR	Irms		Isat	
ANRL201610-R22□	0.22	M/N	0.040	2.80	3.10	3.70	4.10
ANRL201610-R24□	0.24	M/N	0.040	2.80	3.10	3.70	4.10
ANRL201610-R33□	0.33	M/N	0.048	2.40	2.90	3.00	3.70
ANRL201610-R47□	0.47	M/N	0.060	2.30	2.60	2.30	2.85
ANRL201610-R68□	0.68	M/N	0.076	2.00	2.20	1.95	2.45
ANRL201610-1R0□	1.0	M/N	0.114	1.45	1.60	1.65	1.85
ANRL201610-1R5□	1.5	M/N	0.174	1.10	1.20	1.35	1.65
ANRL201610-2R2M	2.2	M	0.265	1.05	1.15	1.20	1.45
ANRL201610-3R3M	3.3	M	0.345	0.85	0.95	1.00	1.20
ANRL201610-4R7M	4.7	M	0.480	0.70	0.80	0.75	0.90
ANRL201610-6R8M	6.8	M	0.800	0.55	0.60	0.70	0.85
ANRL201610-8R2M	8.2	M	0.940	0.53	0.60	0.68	0.78
ANRL201610-100M	10	M	1.000	0.50	0.60	0.65	0.70

ELECTRICAL CHARACTERISTICS

ANRL252010 Series

Part Number	Inductance	Inductance Tolerance	DC Resistance	Heat Rating Current		Saturation Current	
	@100kHz,1V		Max.	Max.	Typ.	Max.	Typ.
Units	μH	M=±20%	Ω	A		A	
Symbol	L	N=±30%	DCR	Irms		Isat	
ANRL252010-R24□	0.24	M/N	0.034	2.75	3.00	3.60	4.40
ANRL252010-R33□	0.33	M/N	0.040	2.45	2.70	3.60	4.30
ANRL252010-R47□	0.47	M/N	0.044	2.40	2.60	2.80	3.20
ANRL252010-R68□	0.68	M/N	0.062	2.10	2.35	2.75	3.10
ANRL252010-1R0□	1.0	M/N	0.080	1.85	2.05	2.05	2.50
ANRL252010-1R5□	1.5	M/N	0.108	1.55	1.70	1.70	2.05
ANRL252010-2R2M	2.2	M	0.150	1.35	1.50	1.50	1.75
ANRL252010-3R3M	3.3	M	0.228	1.05	1.20	1.10	1.35
ANRL252010-4R7M	4.7	M	0.330	0.90	1.00	1.00	1.15
ANRL252010-5R6M	5.6	M	0.480	0.80	0.90	0.90	1.05
ANRL252010-6R8M	6.8	M	0.480	0.72	0.80	0.80	0.95
ANRL252010-8R2M	8.2	M	0.572	0.69	0.78	0.73	0.85
ANRL252010-100M	10	M	0.600	0.65	0.75	0.65	0.75
ANRL252010-120M	12	M	0.850	0.58	0.62	0.58	0.62
ANRL252010-150M	15	M	1.050	0.45	0.50	0.50	0.55
ANRL252010-220M	22	M	1.344	0.32	0.38	0.40	0.45

ANRL252012 Series

Part Number	Inductance	Inductance Tolerance	DC Resistance	Heat Rating Current		Saturation Current	
	@100kHz,1V		Max.	Max.	Typ.	Max.	Typ.
Units	μH	M=±20%	Ω	A		A	
Symbol	L	N=±30%	DCR	Irms		Isat	
ANRL252012-R24□	0.24	M/N	0.023	4.10	4.50	4.10	4.80
ANRL252012-R33□	0.33	M/N	0.031	3.35	3.70	4.00	4.70
ANRL252012-R47□	0.47	M/N	0.036	3.00	3.30	3.80	4.50
ANRL252012-R68□	0.68	M/N	0.047	2.30	2.50	3.00	3.30
ANRL252012-1R0□	1.0	M/N	0.060	2.30	2.60	2.25	2.50
ANRL252012-1R2□	1.2	M/N	0.078	2.00	2.20	2.20	2.50
ANRL252012-1R5□	1.5	M/N	0.090	1.80	2.00	2.00	2.35
ANRL252012-1R8□	1.8	M/N	0.108	1.75	1.90	1.95	2.20
ANRL252012-2R2M	2.2	M	0.108	1.75	1.90	1.75	1.90
ANRL252012-2R7M	2.7	M	0.156	1.40	1.50	1.30	1.60
ANRL252012-3R3M	3.3	M	0.156	1.40	1.50	1.20	1.35
ANRL252012-4R7M	4.7	M	0.228	1.10	1.20	1.10	1.20
ANRL252012-5R6M	5.6	M	0.330	1.00	1.15	1.00	1.10
ANRL252012-6R8M	6.8	M	0.360	0.95	1.05	0.90	1.10
ANRL252012-8R2M	8.2	M	0.522	0.80	0.90	0.80	0.92
ANRL252012-100M	10	M	0.522	0.78	0.86	0.70	0.85
ANRL252012-150M	15	M	1.000	0.50	0.60	0.60	0.70
ANRL252012-220M	22	M	1.290	0.48	0.55	0.45	0.55

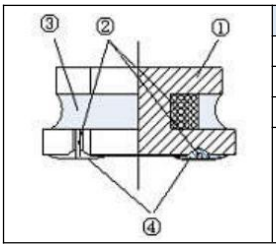
ELECTRICAL CHARACTERISTICS

- ANRL252012 Series

Part Number	Inductance	Inductance Tolerance	DC Resistance	Heat Rating Current		Saturation Current	
	@100kHz,1V		Max.	Max.	Typ.	Max.	Typ.
Units	μH	M=±20% N=±30%	Ω	A		A	
Symbol	L		DCR	Irms		Isat	
ANRL252012-330M	33	M	1.840	0.35	0.40	0.35	0.40
ANRL252012-470M	47	M	2.250	0.20	0.28	0.30	0.37

- All test data is referenced to 20℃ ambient.
- Rated current: Isat or Irms, whichever is smaller.
- Irms:DC current that causes the temperature rise (△T =40℃) from 20℃ ambient.
- Isat: DC current at which the inductance drops approximate 30% from its value without current.
- Storage temperature range (packaging conditions): -40℃ ~ +85℃ and RH 70% (Max.).
- Absolute maximum voltage: DC 25V

STRUCTURE

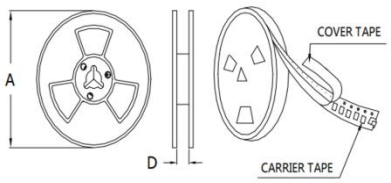


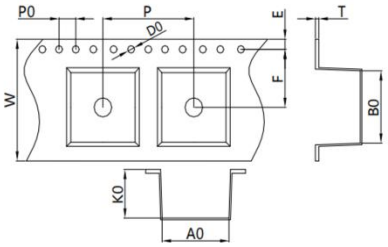
NO	Components	Material
1	Core	soft magnetic metal
2	Wire	Polyurethane system enameled copper wire
3	Magnetic Glue	Epoxy resin and magnetic powder
4	Plating	AgNiSn or FeNiCu + Sn Alloy

STRUCTURE

- Packaging (unit: mm)
- Packaging dimensions：☐13”Plate ☑7”Plate
- Plate：2000 PCS

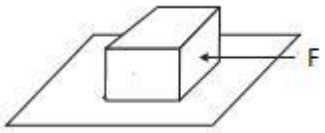
	13”Plate	7”Plate
A	Φ330±2.0	Φ178±2.0
D	8.5	





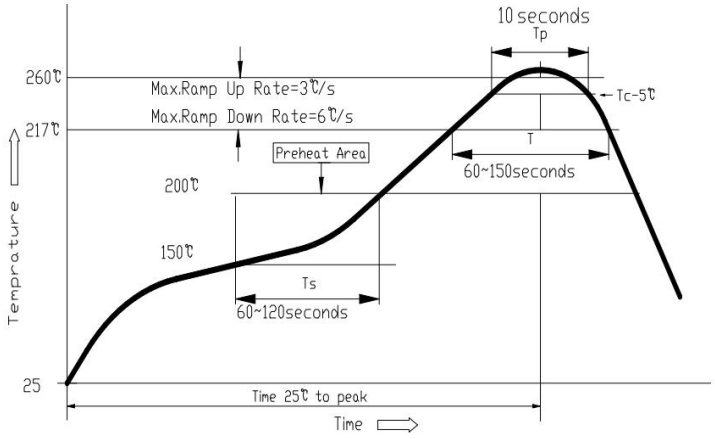
Size	Item	W	A0	B0	K0
202610	(mm)	8.0±0.1	1.9±0.1	2.2±0.1	1.2±0.1
252010	(mm)	8.0±0.3	2.35±0.2	2.65±0.2	1.4±0.1
252012	(mm)	8.0±0.3	2.35±0.2	2.65±0.2	1.4±0.1
P	T	E	F	D0	P0
4.0±0.1	0.25±0.1	1.75±0.1	3.5±0.1	1.5±0.1	4.0±0.1
4.0±0.1	0.25±0.1	1.75±0.1	3.5±0.1	1.5±0.1	4.0±0.2
4.0±0.1	0.25±0.1	1.75±0.1	3.5±0.1	1.5±0.1	4.0±0.2

RELIABILITY TEST

TEST ITEM	SPECIFICATION	TEST CONDITION
High temperature Storage test	1. No significant defects in appearance. 2.ΔL/L≦10% 3.ΔDCR/DCR≦10%	Temperature: 125℃±5℃ (N: Follow the product specification for the setting.) Time : 96±2 hours Place the samples for one hour at room temperature and test them within two hours
Low temperature Storage test	1. No significant defects in appearance. 2.ΔL/L≦10% 3.ΔDCR/DCR≦10%	Temperature: -40℃±5℃ (M: Follow the product specification for the setting) Time : 96±2 hours Place the samples for one hour at room temperature and test them within two hours.
Humidity test	1. No significant defects in appearance. 2.ΔL/L≦10% 3.ΔDCR/DCR≦10%	Temperature: 40±2℃ , Humidity: 93±3%RH Time : 96±2 hours Place the samples for one hour at room temperature and test them within two hours
Solderability test	Terminals must have 95% minimum solder coverage	1.Dip pads in flux then dip in solder pot at 245±5°C for 5 second. 2.Solder: lead free 3.Flux: rosin flux
Heat endurance of flow soldering	1. No significant defects in appearance. 2.ΔL/L≦10% 3.ΔDCR/DCR≦10%	1.Refer to the above reflow curve and go through the reflow for twice. 2.The peak temperature : 260+0/-5℃
Vibration test	1.No significant defects in appearance. 2.No short and no open.	Apply frequency 10~55~10Hz and amplitude 1.5mm, 1 min/cycle in X Y and Z direction for 2 hours each. (total 6 hours)
Terminal strength push test	1. Applied force:10N Duration: 10sec 2.Solder paste thickness:0.12mm 3.Meet the above requirements without any loose termina	Solder the test samples to the PCB through245℃ reflow, apply a standard force on the side of the test samples for 10 seconds. 

RECOMMENDED SOLDERING TECHNOLOGIES

- Soldering Materials.
- ☆ Solder:Sn-3.0Ag-0.5Cu.
- ☆ Flux:Use rosin-based flux,but not strongly acidic flux (with chlorine exceeding 0.2wt%).Do not use water-soluble flux.
- Reflow Soldering Profile.



- Reflow Soldering Profile.
- ☆ Reworking with electric soldering iron must preheating at 150℃ for 1 minute is required,and do not directly touch the core with the tip of the soldering iron.The reworking soldering conditions are as follows.
- Temperature of soldering iron tip:350℃;
- Soldering iron power output:≤30W;
- Diameter of soldering iron end:≤1.0mm;
- Soldering time:＜3 s;



PRECAUTIONS ON USE

- Precautions on Use.

☆ 1.Always wear static control bands to protect against ESD.
☆ 2.Any devices used with the products (soldering irons, measuring instruments) should be properly grounded.
☆ 3.Keep bare hands and metal conductors (i.e., metal desk) away from electrodes or conductive areas that lead to electrodes.
☆ 4.Preheat when soldering.
☆ 5.Don't apply current in excess of the rated current value. It may reduce the impedance or inductance,or cause damage to components due to over-current.
☆ 6.For magnetic products, keep clear of anything that may generate magnetic fields such as speakers and coils. Use non-magnetic tweezers when handing the chips.
☆ 7.When soldering, the electrical characteristics may be varied due to hot energy and mechanical stress.
☆ 8.When coating products with resin, the relatively high resin curing stress may change the electrical characteristics. For exterior coating, select resin carefully so that electrical and mechanical performance of the product is not affected. Before using, please evaluate reliability with the product mounted in your application set.
☆ 9.When mount chips with adhesive in preliminary assembly, do appropriate check before the soldering stage, i.e., the size of land pattern, type of adhesive, amount applied, hardening of the adhesive on proper usage and amounts of adhesive to use.
☆ 10.Mounting density: Add special attention to radiating heat of products when mounting other components nearby. The excessive heat by other products may cause deterioration at joint of this product with substrate.
☆ 11.Since some products are constructed like an open magnetic circuit, narrow spacing between components may cause magnetic coupling.
☆ 12.Please do not give the product any excessive mechanical shocks in transportation.
☆ 13.Please do not touch wires by sharp terminals such as tweezers to avoid causing any damage to wires.
☆ 14.Please do not add any shock and power to the soldered product to avoid causing any damage to chip body.
☆ 15.Please do not touch the electrodes by naked hand as the solderability of the external electrodes may deteriorate by grease or oil on the skin.
☆ 16.Avoid ultrasonic processing, which may cause component falling off and poor pad contact.
☆ 17.When using APV products, customers should record the production batch number for traceability.

SAFETY REMINDERS

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.