

Power Inductor

Automotive Grade

AWVS Series



Overview

Power inductors are passive electronic components used in various circuits to store energy in a magnetic field when electrical current flows through them. They are critical in filtering, energy storage, and noise suppression in power electronic systems. They are designed to handle higher currents and are optimized for minimal power loss and thermal efficiency.

Benefits

1. Automotive grade available
2. No thermal aging
3. High current and efficiency, Magnetic epoxy sealing(Seme-shield)

Applications

1. Automotive Systems for Infotainment, MCU, Dashboard, CCD Module
2. Media player, Audio class
3. Net working, LCD Panel/TV,
4. Base stations, 5G infrastructure, and signal processing systems.
5. Telematics

Product Information

Series	L (mm)	W(mm)	T (mm)	Inductance (μH)
AWVS	3.2	2.5	1.5	0.22 ~ 1200
	3.2	2.5	1.5	
	4.0	4.0	1.2	
	4.0	4.0	1.5~2.0	
	5.0	5.0	1.7~2.2	
	5.0	5.0	4.0	
	5.0	5.0	3.7~4.2	
	6.0	6.0	1.7~2.2	
	6.0	6.0	2.5~3.0	
	6.0	6.0	4.2~4.7	
	6.0	6.0	4.5	
	8.0	8.0	3.7~4.2	
	8.0	8.0	4.0	
	8.0	8.0	4.0	

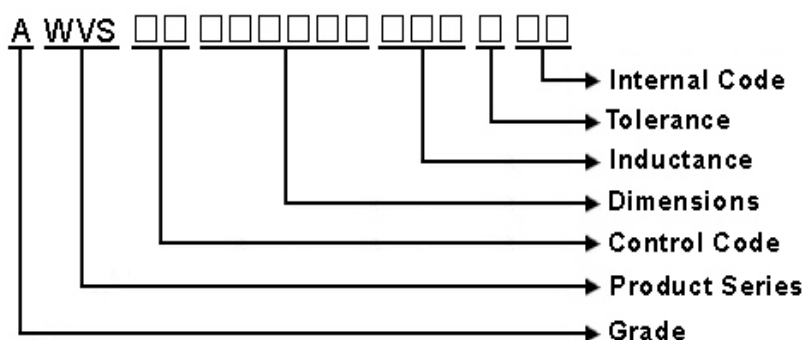


AWVS00322515 Series Specification

AEC-Q200

1 Scope: This specification applies to Wire Wound Power Inductors

2 Part Numbering:

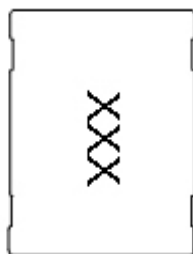


3 Rating:

Operating Temperature: $-40^{\circ}\text{C} \sim 125^{\circ}\text{C}$
(Including self - temperature rise)

Storage Temperature: $-40^{\circ}\text{C} \sim 125^{\circ}\text{C}$
(The storage temperature range is for after the assembly)

4 Marking:



Ex Marking : 6R8

Marking color : Black

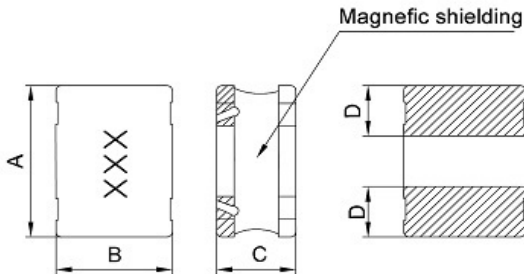
5 Standard Testing Condition

	Unless otherwise specified	In case of doubt
Temperature	Ordinary Temperature(15 to 35°C)	20 to 30°C
Humidity	Ordinary Humidity(25 to 85% RH)	50 to 80 %RH

AWVS00322515 Series Specification

AEC-Q200

6 Configuration and Dimensions:



Dimensions in mm

TYPE	322515
A	3.2±0.2
B	2.5±0.2
C	1.5±0.2
D	1.0typ

Net Weight (grms)

SIZE CODE	Net Weight (grms)
322515	0.048 (typ).

7 Electrical Characteristics:

Part No.	Inductance (uH)	Test Freq.	SRF (MHZ)Min.	RDC (mΩ)±20%	Isat(A) Typ.(Max)	Irms(A) Typ.(Max)	Tolerance (±%)	Marking
AWVS00322515R22□00	0.22	1MHz,1V	300	22	4.5(4.0)	2.9(2.6)	20,30	R22
AWVS00322515R47□00	0.47	1MHz,1V	168	27	3.4(3.0)	2.6(2.3)	20,30	R47
AWVS003225151R0□00	1.0	1MHz,1V	95	40	2.3(2.0)	2.2(2.0)	20,30	1R0
AWVS003225151R5□00	1.5	1MHz,1V	81	47	1.8(1.6)	2.1(1.9)	20,30	1R5
AWVS003225152R2□00	2.2	1MHz,1V	60	57	1.6(1.4)	1.9(1.7)	20,30	2R2
AWVS003225152R7□00	2.7	1MHz,1V	54	70	1.4(1.2)	1.7(1.5)	20,30	2R7
AWVS003225153R3□00	3.3	1MHz,1V	45	77	1.3(1.1)	1.6(1.4)	20,30	3R3
AWVS003225154R7□00	4.7	1MHz,1V	40	110	1.1(0.99)	1.4(1.2)	20,30	4R7
AWVS003225156R8□00	6.8	1MHz,1V	30	160	0.90(0.81)	1.10(0.99)	20,30	6R8
AWVS00322515100□00	10	1MHz,1V	25	220	0.78(0.70)	0.90(0.81)	20,30	100
AWVS00322515120□00	12	1MHz,1V	24	270	0.75(0.67)	0.85(0.76)	20,30	120
AWVS00322515150□00	15	1MHz,1V	21	320	0.60(0.54)	0.78(0.70)	20,30	150
AWVS00322515220□00	22	1MHz,1V	17	470	0.50(0.45)	0.67(0.60)	20,30	220
AWVS00322515330□00	33	1MHz,1V	12	700	0.40(0.36)	0.56(0.50)	20,30	330
AWVS00322515470□00	47	1MHz,1V	11	1000	0.34(0.30)	0.45(0.40)	20,30	470
AWVS00322515680□00	68	1MHz,1V	9.5	1400	0.29(0.26)	0.37(0.33)	20,30	680
AWVS00322515101□00	100	1MHz,1V	7.5	1900	0.23(0.20)	0.30(0.27)	20,30	101
AWVS00322515121□00	120	1MHz,1V	6.7	2800	0.20(0.18)	0.25(0.22)	20,30	121
AWVS00322515221□00	220	1MHz,1V	5.0	4700	0.15(0.13)	0.18(0.16)	20,30	221
AWVS00322515471□00	470	1MHz,1V	3.3	10000	0.10(0.09)	0.12(0.10)	20,30	471
AWVS00322515681□00	680	1MHz,1V	2.5	15000	0.08(0.07)	0.09(0.08)	20,30	681
AWVS00322515102□00	1000	0.1MHz,1V	2.0	23000	0.06(0.05)	0.07(0.06)	20,30	102

NOTE: □-tolerance M=±20% / T=±30%

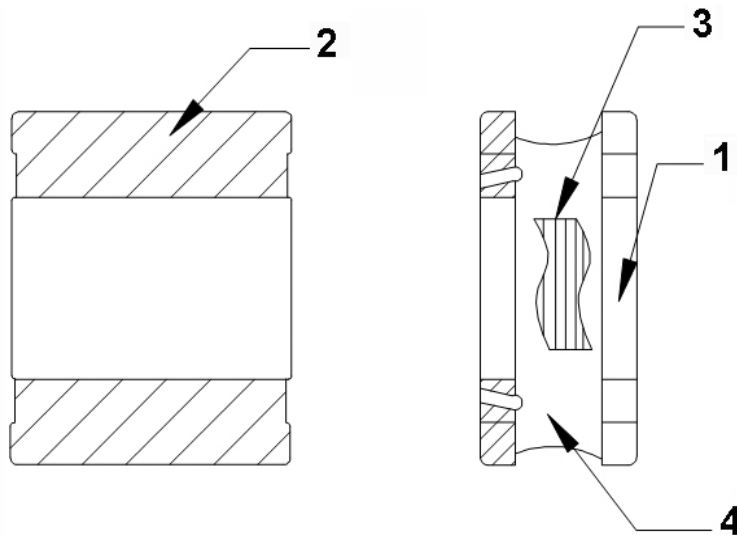
1. Operating temperature range - 4 0 °C ~ 1 2 5 °C(Including self - temperature rise)
2. Isat for Inductance drop 30% from its value without current.
3. Irms for a 40°C temperature rise from 25°C ambient.

AWVS00322515 Series Specification

AEC-Q200

8 AWVS00322515 Series

8.1 Construction:



8.2 Material List:

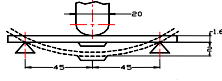
NO	Part	Material
1	Core	Ferrite
2	Terminal	Ag/Cu/Ni/Sn
3	Wire	Copper(180°C)
4	Epoxy	Magnetic powder resin

AWVS00322515 Series Specification

AEC-Q200

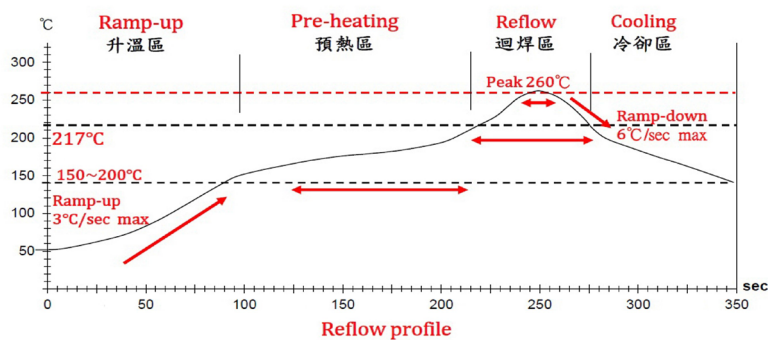
9 Reliability of Wire Wound Power Inductors

1-1.Mechanical Performance

No	Item	Specification	Test Method
1-1-1	Board Flex	The forces applied on the right conditions must not damage the terminal electrode and the ferrite.	Test device shall be soldered on the substrate Substrate Dimension: 100x40x1.6mm Deflection: 2.0mm Keeping Time: 60 sec 
1-1-2	Terminal Strength	The chip must not damage the terminal electrode and the ferrite.	Appendix 1 Note(AEC-Q200-005):Force of 1.8 kg for 60 seconds.
1-1-3	Solderability	The electrodes shall be at least 95% covered with new solder coating.	Pre-heating: 150℃, 1min Solder Composition: Sn/3.0Ag/0.5Cu Solder Temperature: 245±5℃ Immersion Time: 4±1sec
1-1-4	Resistance to Soldering Heat	Appearance:No damage Inductance change shall be within ±10%.	Pre-heating: 150℃, 1min Solder Composition: Sn/Ag3.0/Cu0.5 Solder Temperature: 260±5℃ Immersion Time: 10±1sec
1-1-5	Resistance to Solvents	There must be no change in appearance or obliteration of marking.	Inductors must withstand 6 minutes of alcohol or water.
1-1-6	Mechanical Shock	The forces applied on the right conditions must not damage the terminal electrode and the ferrite.	Pulse shape : Half-sine waveform Impact acceleration : 100 g Pulse duration : 6 ms Number of shocks : 18 shocks (3 shocks for each face) Orientation : Bottom, top, left, right, front and rear faces
1-1-7	Vibration	Appearance:No damage Inductance change shall be within ±10%.	Vibration waveform: Sine waveform Vibration frequency: 10Hz~2000Hz Vibration acceleration: 5g Sweep rate: 0.764386octave/minute Duration of test: 12 cycles each of 3 orientations 20 minutes for each cycle Vibration axes: X, Y & Z

1-2.Environmental Performance

No	Item	Specification	Test Method
1-2-1	High Temperature Exposure (Storage)	Appearance:No damage (for microscope of CASTOR MZ-420X)Inductance change shall be within ±10%.	Temperature: 125±3℃ Time: 1000hrs Measured after exposure in the room condition for 24hrs
1-2-2	Operational Life		Temperature: 125±2℃ Applied Current : Rated Current Time: 1000± 24 hrs Measured after exposure in the room condition for 24hrs
1-2-3	Biased Humidity		Temperature: 85±2℃ Relative Humidity: 85% Time: 1000hrs Measured after exposure in the room condition for 24hrs
1-2-4	Temperature Cycling		Total cycles: 1000 cycles Temperature Cycling Test Conditions : -40 to +125 ℃ Soak Mode Condition : 30 minutes Measured after exposure in the room condition for 24hrs
1-2-5	ESD		Test mode : Contact Discharge Discharge level : ±6KV, Discharge interval : 1 second Polarity of the output voltage : Positive and negative Number of discharge : Discharge +/- for 1 time for the 2 test points. Test Mode : Air Discharge Discharge level : ±12KV, ±16KV, ±25KV Discharge interval : <5 seconds Polarity of the output voltage : Positive and negative Number of discharge : Discharge +/- for 1 time for the 1~2 test points.



Lead-Free(LF)標準溫度分析範圍

Refer to J-STD-020C

管制項目 Item.	升温區 Ramp-up	預熱區 Pre-heating	迴焊區 Reflow	Peak Temp	冷卻區 Cooling
溫度範圍 Temp.scope	R.T ~ 150°C	150°C ~ 200°C	Above 217°C	260±5°C	Peak Temp.~150°C
標準時間 Time spec.	—	60 ~ 180 sec	60 ~ 150 sec	20 ~ 40 sec	—
實際時間 Time result	—	75 ~ 100 sec	90 ~ 120 sec	20 ~ 35 sec	—

NOTE :

1. Re-flow possible times : within 2 times
2. Nitrogen adopted is recommended while in re-flow
3. Products can only be soldered with reflow

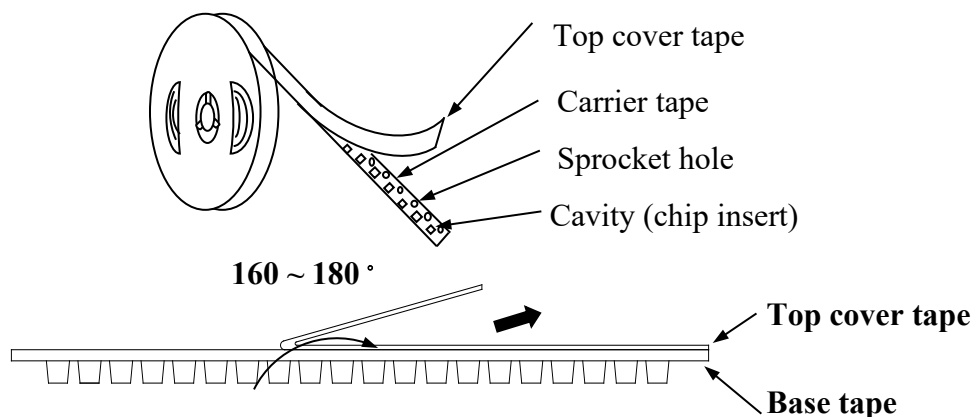
AWVS00322515 Series Specification

AEC-Q200

10 Packaging:

10.1 Packaging -Cover tape

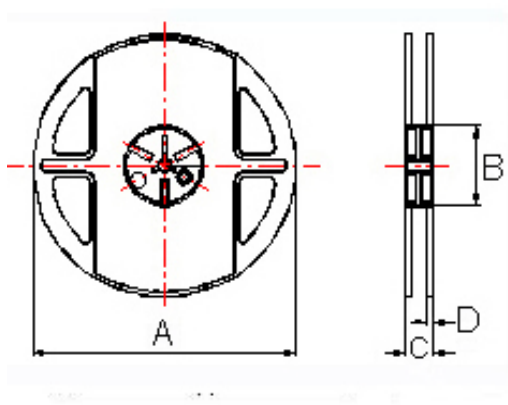
The force for tearing off cover tape is 10 to 100 grams in the arrow direction.



10.2 Packaging Quantity

TYPE	PCS/REEL
322515	2000

10.3 Reel Dimensions

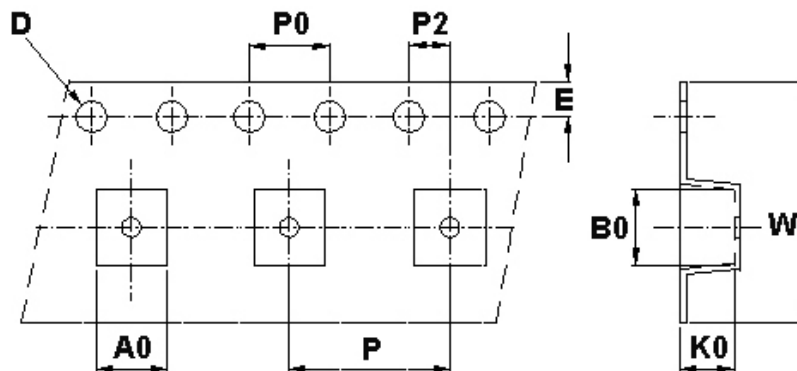


Dimensions in mm

TYPE	A	B	C	D
322515	178	60	9	1.5

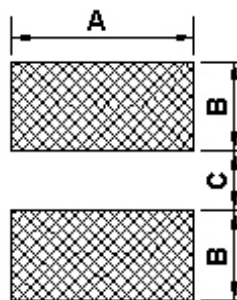
10 Packaging:

10.4 Tape Dimensions in mm



TYPE	A0	B0	K0	D	E	W	P	P0	P2
322515	2.85	3.56	1.80	1.55	1.75	8	4	4	2

11 Recommended Land Pattern:



Dimensions in mm

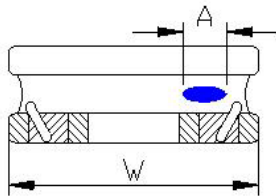
TYPE	A	B	C
322515	2.6	1.2	1.0

12 Note:

- Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.
- Do not knock nor drop.
- All the items and parameters in this product specification have been prescribed on the premise that our product is used for the purpose, under the condition and in the environment agreed upon between you and us. You are requested not to use our product deviating from such agreement.
- The storage period is less than 12 months. Be sure to follow the storage conditions (Temperature: 5 to 40°C, Humidity: 10 to 75% RH or less).
If the storage period elapses, the soldering of the terminal electrodes may deteriorate.
- Do not use or store in locations where there are conditions such as gas corrosion (salt, acid, alkali, etc.).
- The moisture sensitivity level (MSL) of products is classified as level 1.

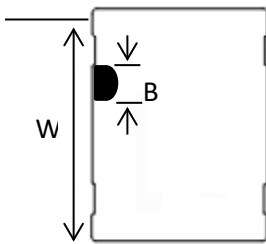
12 Note:

7. Void Appearance tolerance Limit



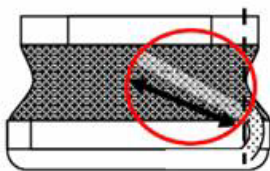
Exposed wire tolerance limit of coating resin part on product side.
The unilateral should be no more than two holes.

$$\begin{aligned} A &\leq W/2 \text{ GOOD} \\ A &> W/2 \text{ NG} \end{aligned}$$



The appearance standard pf the chipping size in top side.

$$\begin{aligned} B &\leq W/5 \text{ GOOD} \\ B &> W/5 \text{ NG} \end{aligned}$$



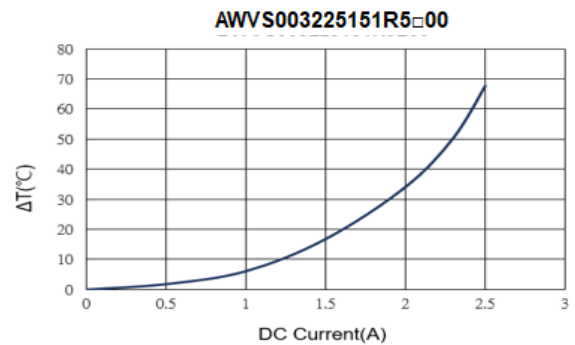
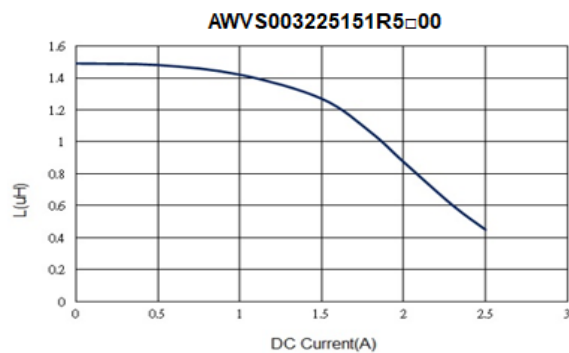
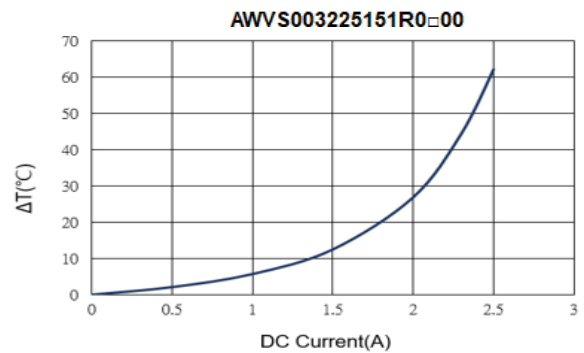
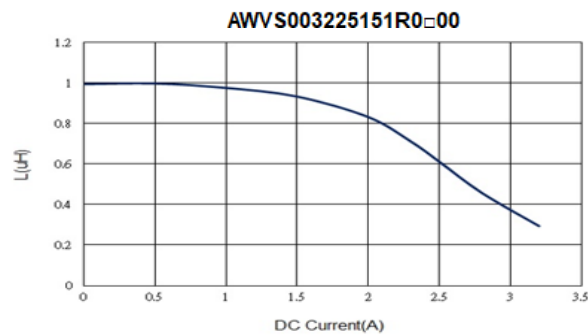
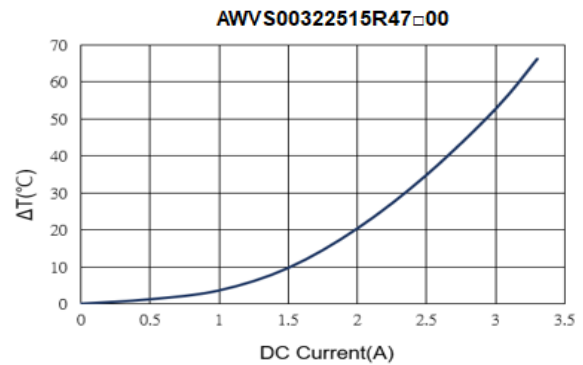
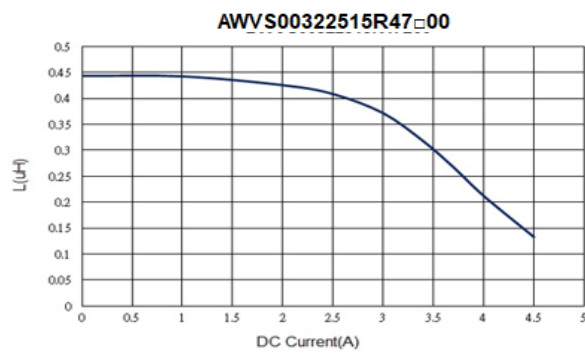
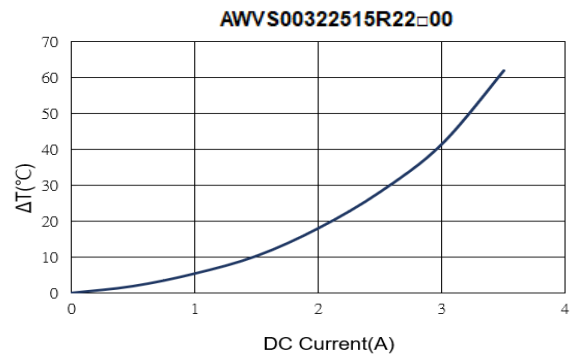
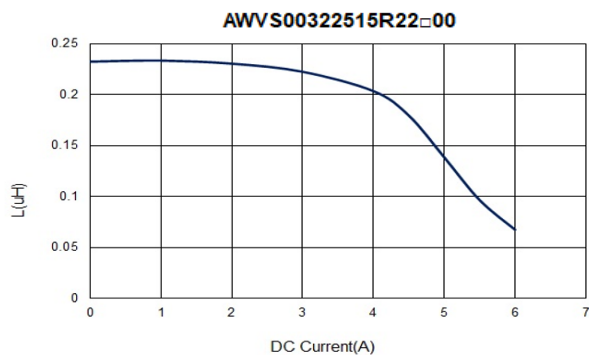
External appearance criterion for exposed wire

Exposed end of the winding wire at the side should be acceptable.

AWVS00322515 Series Specification

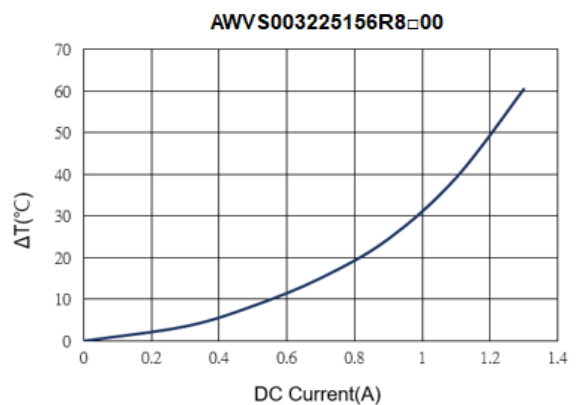
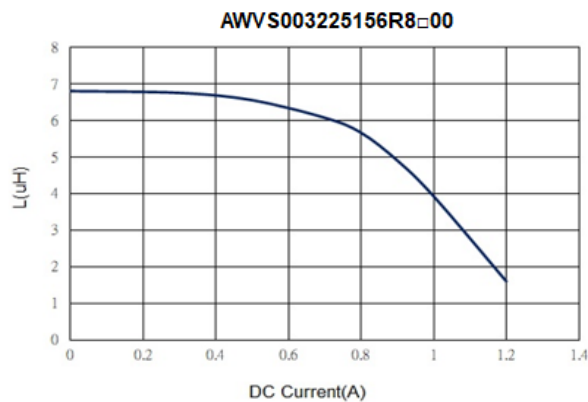
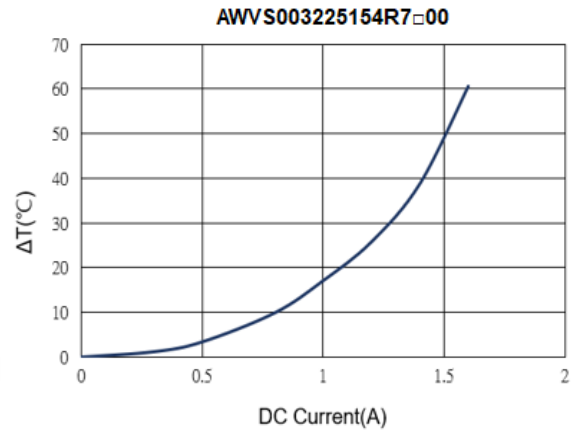
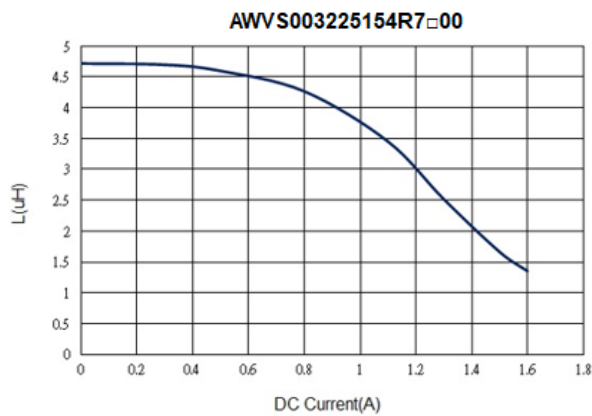
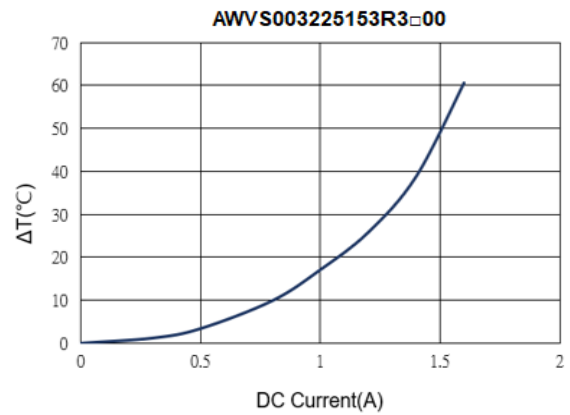
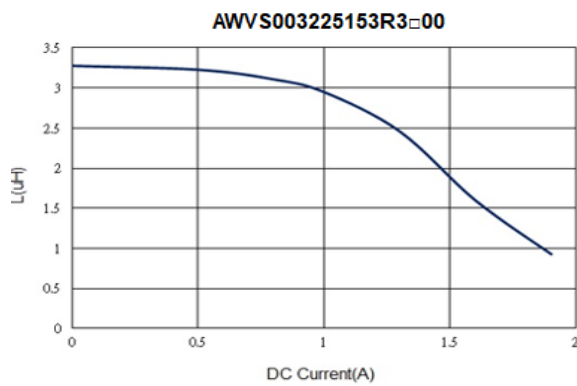
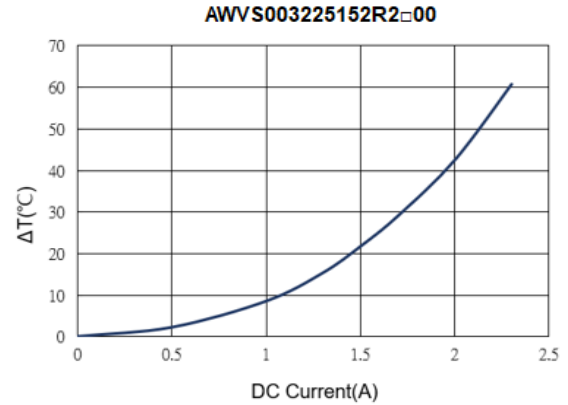
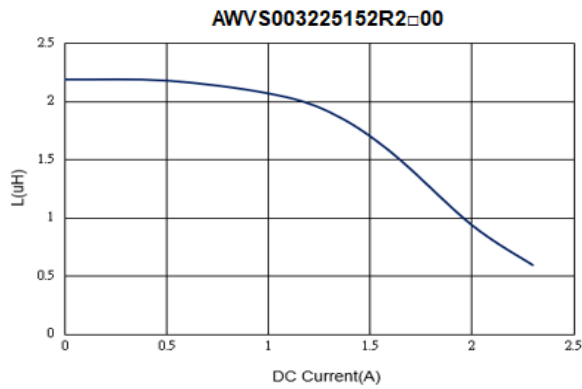
AEC-Q200

13 Graph: AWVS00322515 Series Graph



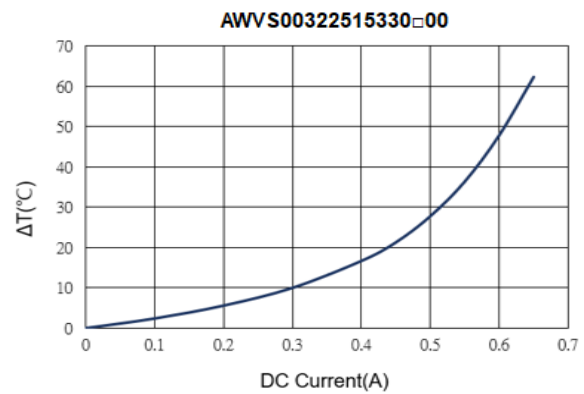
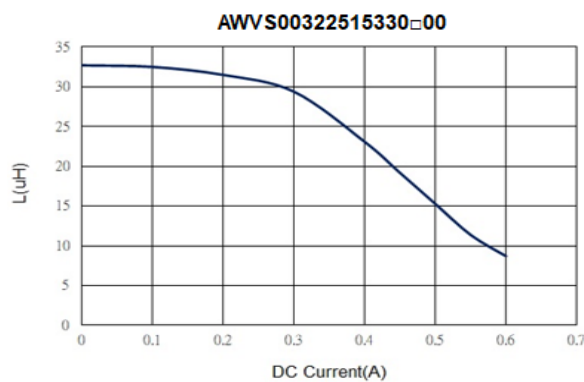
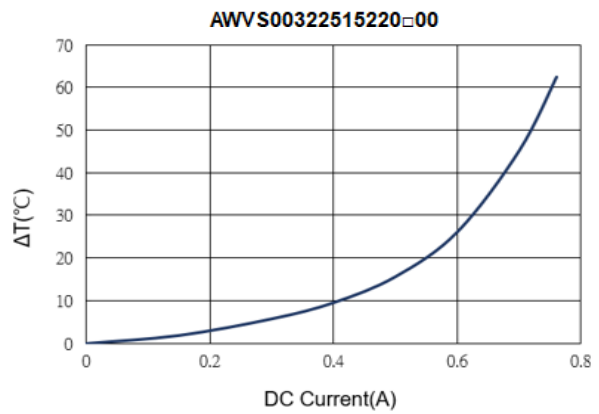
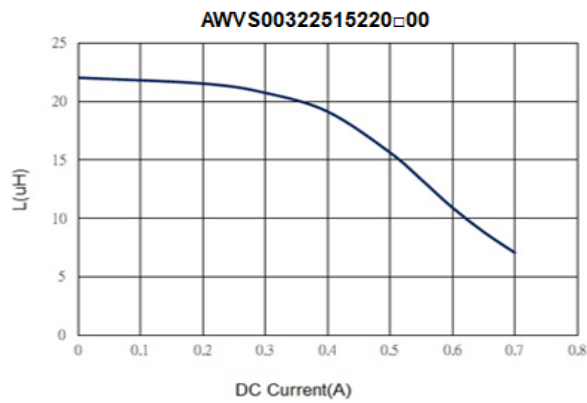
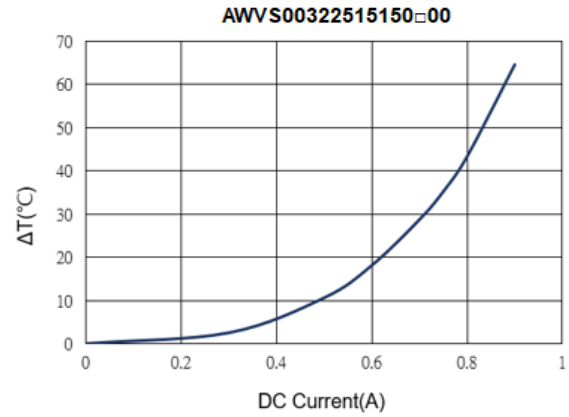
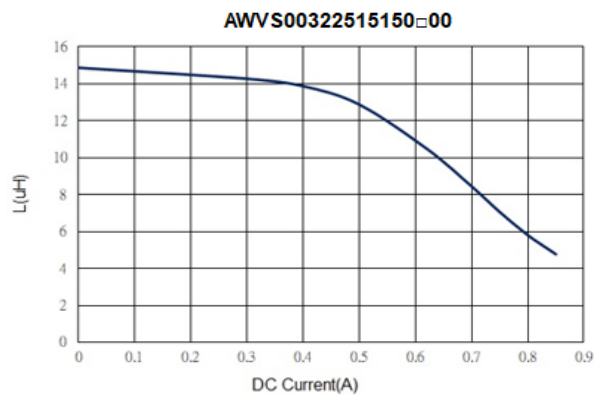
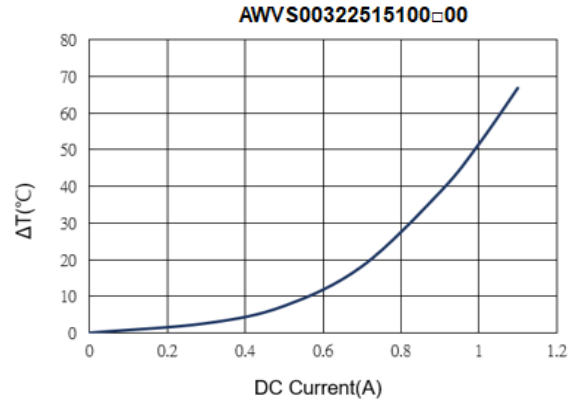
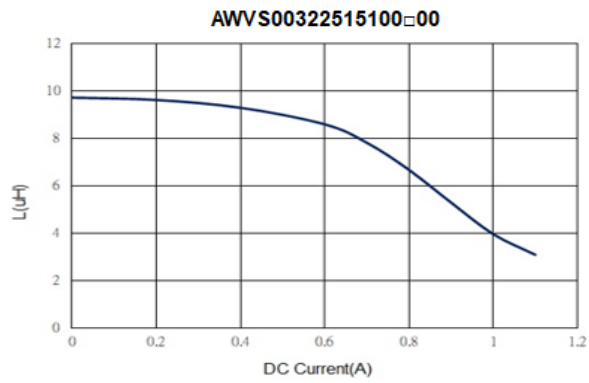
AWVS00322515 Series Specification

AEC-Q200



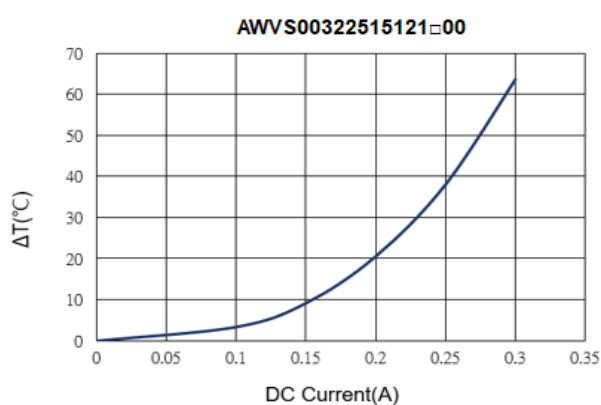
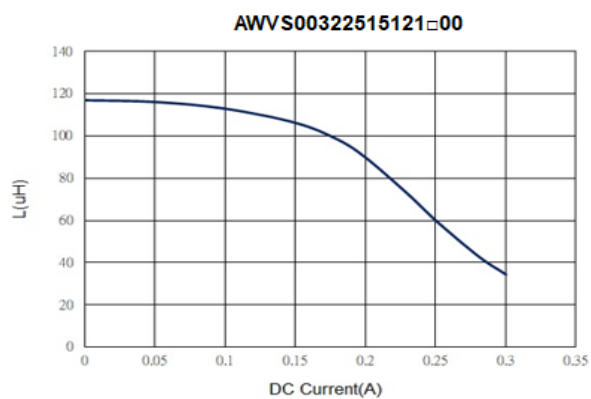
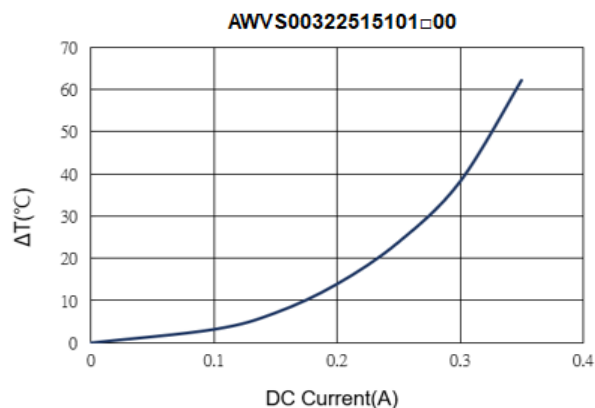
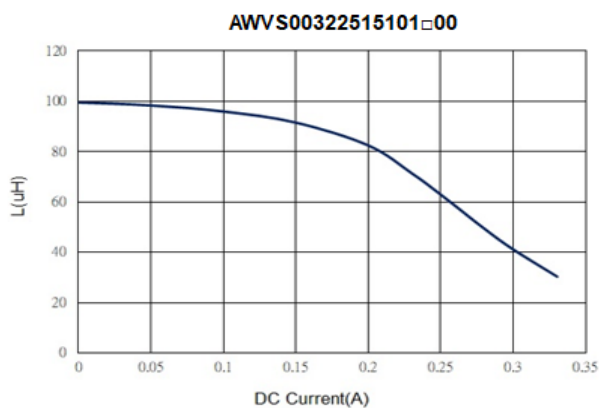
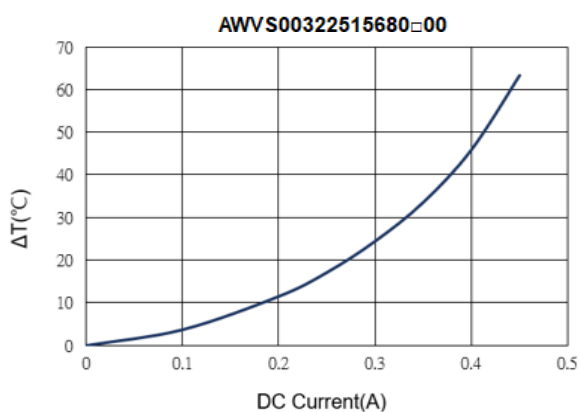
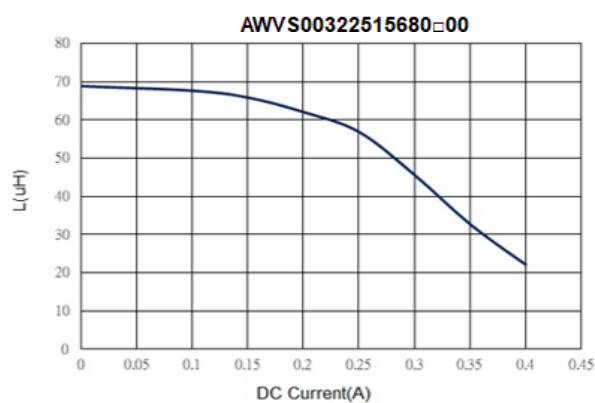
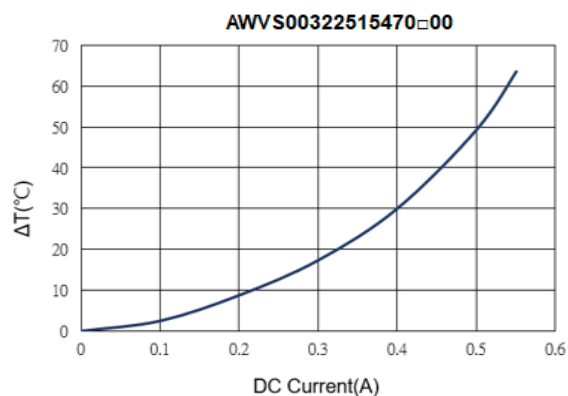
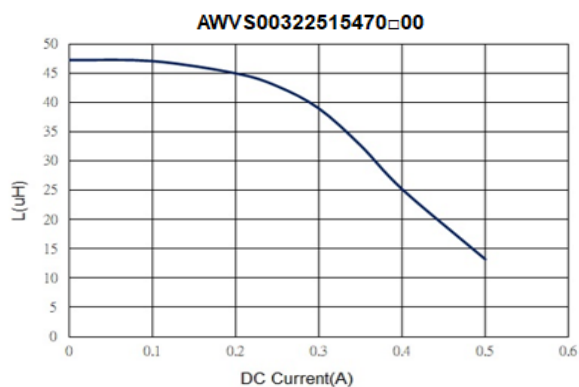
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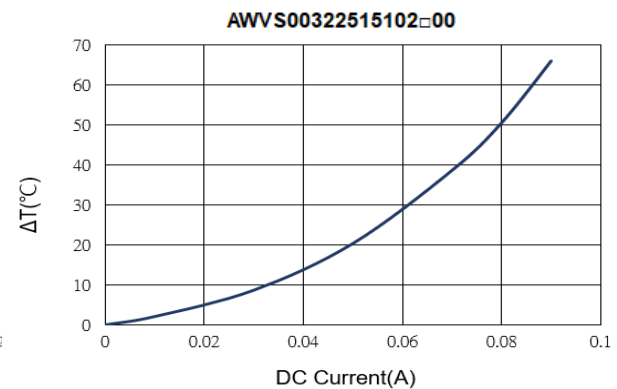
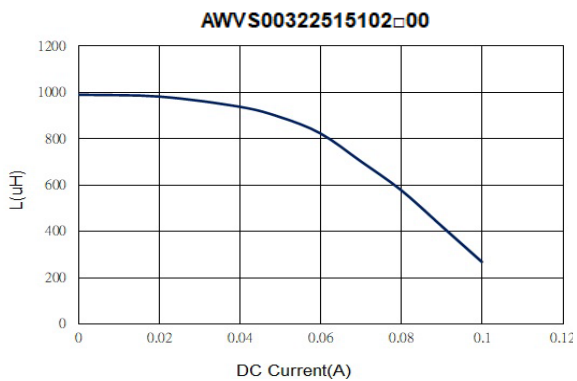
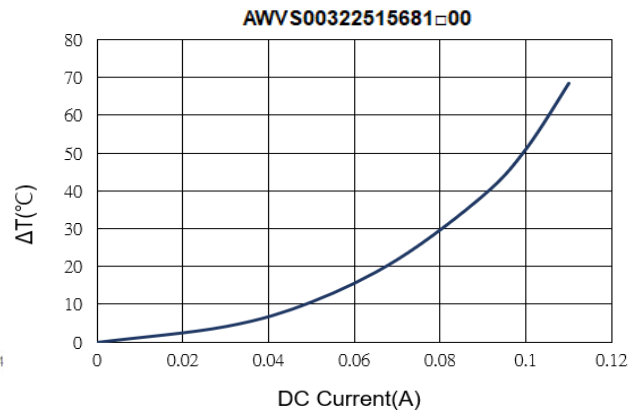
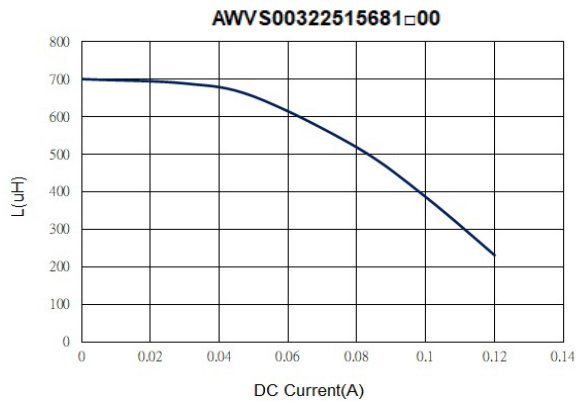
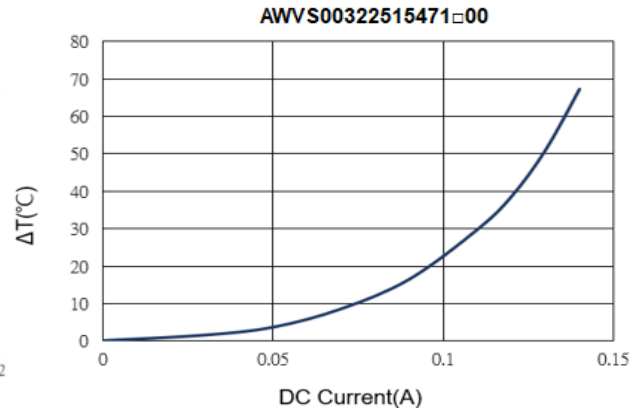
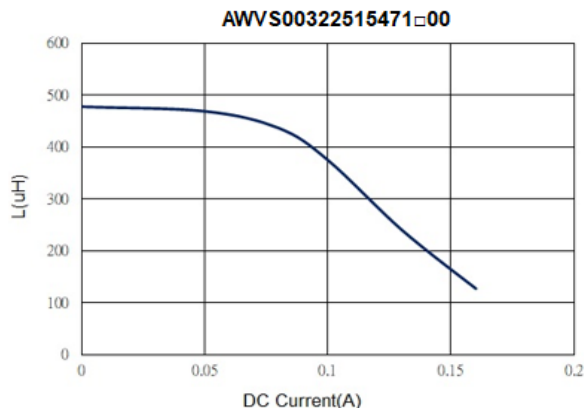
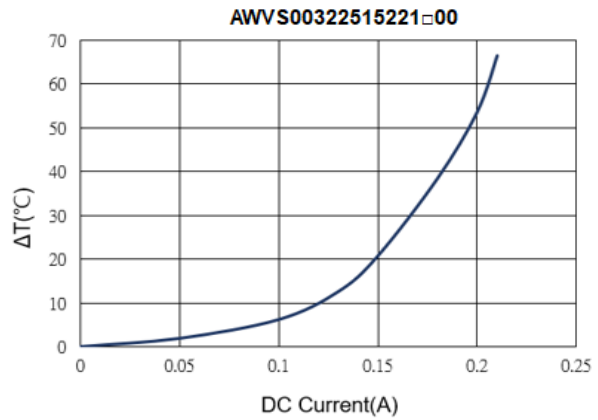
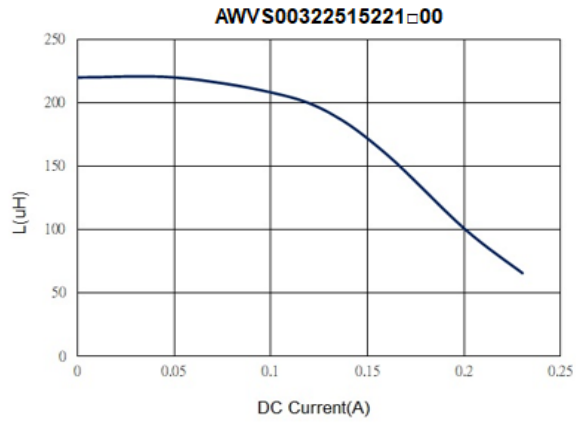
AWVS00322515 Series Specification

AEC-Q200



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