

Power Inductor

Automotive Grade

APSD 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. Plated terminals on the ferrite core, sample structure
3. Simple structure.
4. Operating temperature range $-40^{\circ}\text{C} \sim 150^{\circ}\text{C}$ (Including self - temperature rise)

Applications

1. Automotive Systems for CCD Module
2. Lighting, LCD Panel/TV
3. Net working
4. Home device

Product Information

Series	L (mm)	W (mm)	T (mm)	Inductance (μH)
APSD	3.3	3.0	2.1	0.15 ~ 1000
	4.5	4.0	3.2	
	5.8	5.2	3.0	
	5.8	5.2	4.5	
	7.8	7.0	3.5	
	7.8	7.0	5.0	

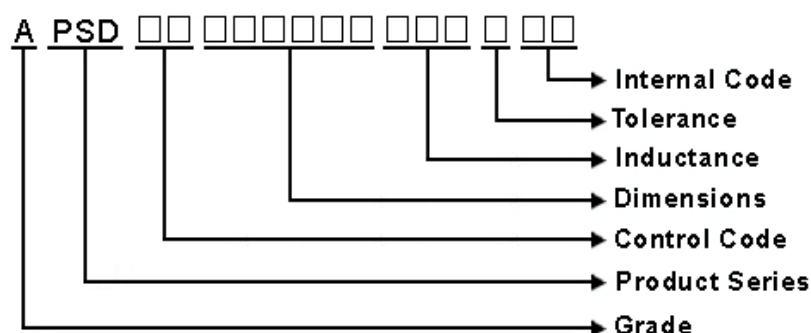


APSD00060545 Series Specification

AEC-Q200

1 Scope: This specification applies to SMD Unshielded Power Inductors

2 Part Numbering:



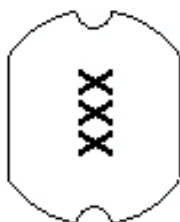
3 Rating:

Operating Temperature: - 40°C ~ + 125°C (Including self temp. rise)

Storage Temperature: - 40°C ~ + 125°C (For after the circuit board is mounted)

Storage Temperature: (on tape & reel): -20°C to +40°C; 75% RH max.

4 Marking:



Ex Marking : 100

Marking color : Black

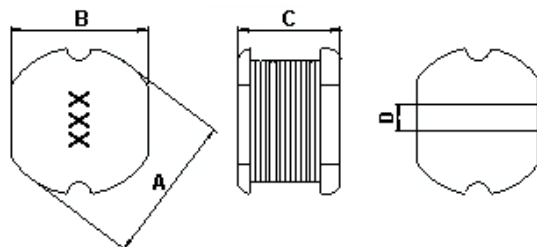
5 Standard Testing Condition

	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

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6 Configuration and Dimensions:



Dimensions in mm

TYPE	060545
A	5.8±0.3
B	5.2±0.3
C	4.5±0.4
D	1.3

Net Weight (grms)

SIZE CODE	Net Weight (grms)
060545	0.5(Typ.)

7 Electrical Characteristics:

Part No.	Inductance (uH)	Test Freq.	RDC (Ω)Max.	Isat (A)	Irms (A)	Tolerance (±%)	Marking
APSD000605451R8□00	1.8	7.96 MHz, 1 V	0.02	3.5	3.5	20	1R8
APSD000605452R2□00	2.2	7.96 MHz, 1 V	0.023	3.2	3.2	20	2R2
APSD000605453R3□00	3.3	7.96 MHz, 1 V	0.0314	2.59	2.59	10,20	3R3
APSD000605453R5□00	3.5	7.96 MHz, 1 V	0.03	2.4	2.4	20	3R5
APSD000605454R7□00	4.7	7.96 MHz, 1 V	0.0372	2.3	2.3	10,20	4R7
APSD000605456R8□00	6.8	7.96 MHz, 1 V	0.057	1.8	1.8	20	6R8
APSD000605458R2□00	8.2	7.96 MHz, 1 V	0.0594	1.7	1.7	20	8R2
APSD00060545100□00	10	2.52 MHz, 1 V	0.1	1.44	1.44	10,20	100
APSD00060545120□00	12	2.52 MHz, 1 V	0.12	1.4	1.4	20	120
APSD00060545150□00	15	2.52 MHz, 1 V	0.14	1.3	1.3	10,20	150
APSD00060545180□00	18	2.52 MHz, 1 V	0.15	1.23	1.23	20	180
APSD00060545220□00	22	2.52 MHz, 1 V	0.18	1.11	1.11	20	220
APSD00060545270□00	27	2.52 MHz, 1 V	0.2	0.97	0.97	20	270
APSD00060545330□00	33	2.52 MHz, 1 V	0.23	0.88	0.88	10,20	330
APSD00060545390□00	39	2.52 MHz, 1 V	0.32	0.8	0.8	10,20	390
APSD00060545470□00	47	2.52 MHz, 1 V	0.37	0.72	0.72	10,20	470
APSD00060545560□00	56	2.52 MHz, 1 V	0.42	0.68	0.68	10,20	560
APSD00060545680□00	68	2.52 MHz, 1 V	0.46	0.61	0.61	10,20	680
APSD00060545820□00	82	2.52 MHz, 1 V	0.6	0.58	0.58	10,20	820
APSD00060545101□00	100	1 kHz, 1 V	0.7	0.52	0.52	10,20	101
APSD00060545121□00	120	1 kHz, 1 V	0.93	0.48	0.48	10,20	121
APSD00060545151□00	150	1 kHz, 1 V	1.1	0.4	0.4	10,20	151
APSD00060545181□00	180	1 kHz, 1 V	1.38	0.38	0.38	10,20	181
APSD00060545221□00	220	1 kHz, 1 V	1.57	0.35	0.35	10,20	221
APSD00060545271□00	270	1 kHz, 1 V	1.85	0.29	0.29	10,20	271

NOTE: □-tolerance K=±10% / M=±20%

- Operating temperature range - 40 °C ~ 125 °C(Including self - temperature rise)
- Isat for Inductance drop 10% from its value without current.
- Irms for a 40°C temperature rise from 25°C ambient.
- The actual use current is suggested not to be out of Isat*80%

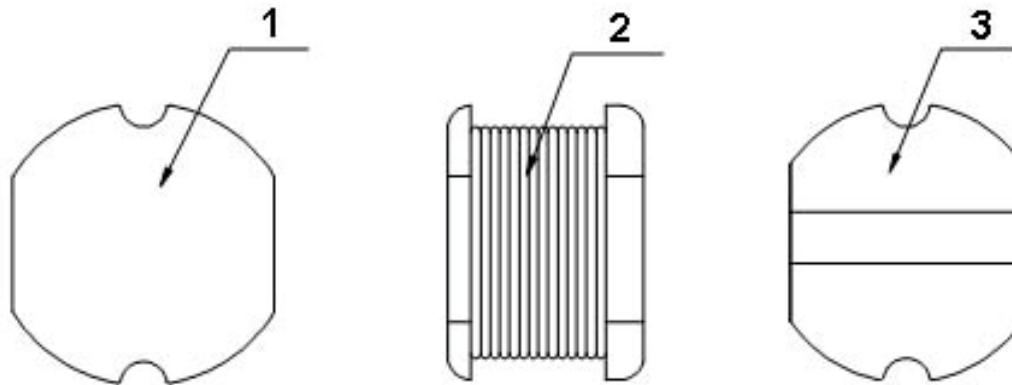
APSD00060545 Series Specification

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Part No.	Inductance (uH)	Test Freq.	RDC (Ω)Max.	Isat (A)	Irms (A)	Tolerance ($\pm$ %)	Marking
APSD00060545331□00	330	1 kHz, 1 V	2	0.28	0.28	10,20	331
APSD00060545391□00	390	1 kHz, 1 V	2.6	0.26	0.26	10,20	391
APSD00060545471□00	470	1 kHz, 1 V	3	0.12	0.12	10,20	471
APSD00060545561□00	560	1 kHz, 1 V	4.19	0.1	0.1	10,20	561
APSD00060545681□00	680	1 kHz, 1 V	4.44	0.08	0.08	10,20	681
APSD00060545821□00	820	1 kHz, 1 V	5.12	0.05	0.05	10,20	821
APSD00060545102□00	1000	1 kHz, 1 V	10	0.03	0.03	10,20	102

8 APSD00060545 Series

8.1 Construction:



8.2 Material List:

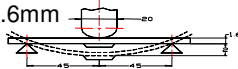
No	Part	Material
1	Core	Ferrite
2	Wire	Magnet Wire
3	Terminal	Sn/Ag3.0/Cu0.5

APSD00060545 Series Specification

AEC-Q200

9 Reliability Of Ferrite Wire Wound Power Inductor

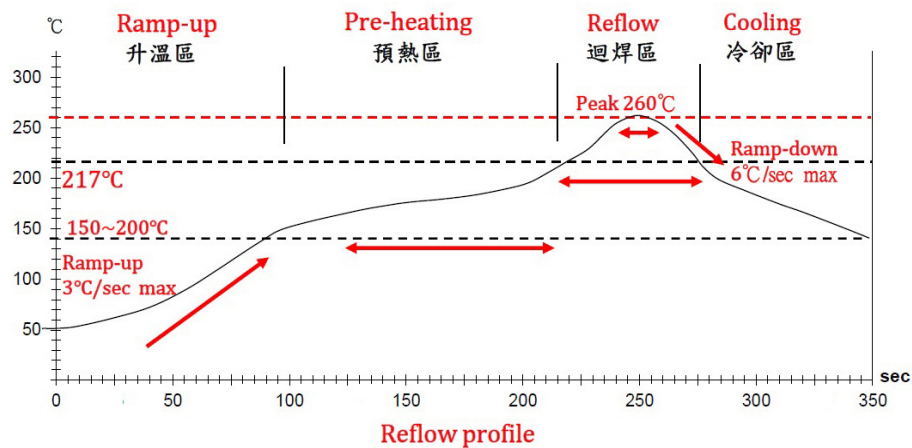
1-1.Mechanical Performance

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	Refer to AEC-Q200-005 Test device shall be soldered on the substrate Substrate Dimension: 100x40x1.6mm Deflection: 2.0mm Keeping Time: 60sec 
1-1-2	Resistance to Soldering Heat	Appearance: No damage Inductance change shall be within $\pm 10\%$.	Refer to MIL-STD-202 Method 210 Pre-heating: 150°C, 1min Solder Composition: Sn/Ag3.0/Cu0.5(Pb-Free) Solder Temperature: 250 $\pm$ 5°C Immersion Time: 10 $\pm$ 1sec
1-1-3	Solder ability	The electrodes shall be at least 95% covered with new solder coating	Refer to J-STD-002 Pre-heating: 150°C, 1min Solder Composition: Sn/Ag3.0/Cu0.5(Pb-Free) Solder Temperature: 245 $\pm$ 5°C (Pb-Free) Immersion Time: 4 $\pm$ 1sec
1-1-4	Terminal Strength Test	Appearance: No damage	Refer AEC-Q200-006 Soldered on PCB for testing as fig. Force : 1.8kg Keeping Time: 60 seconds.
1-1-5	Resistance to Solvent	There must be no change in appearance or obliteration of marking	Refer to MIL-STD-202 Method 215 Inductors must withstand 6 minutes of alcohol or water Sample Size : 15 pcs
1-1-6	Vibration	Appearance: No damage Inductance change shall be within $\pm 10\%$.	Refer MIL-STD-202 Method 204 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	Temperature Cycle	Appearance: No damage Inductance change shall be within $\pm 30\%$	Refer to JESD Method JA-104 Total cycles: 1000 cycles Temperature Cycling Test Conditions : -40 to +125 °C -40 °C Soak Mode Condition : 30 minutes 125 °C Soak Mode Condition : 30 minutes Measured after exposure in the room condition for 24hrs
1-2-2	Biased Humidity Resistance		Refer to MIL-STD-202 Method 103 Temperature: 85 $\pm$ 2°C Relative Humidity:85% / Time: 1000hrs Measured after exposure in the room condition for 24hrs
1-2-3	High Temperature Exposure (Storage)		Refer to MIL-STD-202 Method 108 Temperature: 125 $\pm$ 3°C Time: 1000hrs Measured after exposure in the room condition for 24hrs
1-2-4	Operational Life		Refer to MIL-STD-202 Method 108 Temperature: 125 $\pm$ 3°C Applied Current : Rated Current Time: 1000hrs Measured after exposure in the room condition for 24hrs

Reflow Soldering Profile



Lead-Free(LF)標準溫度分析範圍

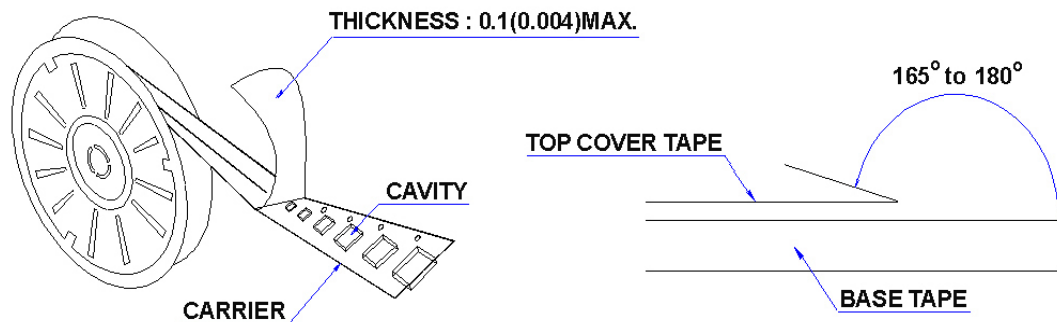
Refer to J-STD-020C

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	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	—

10 Packaging:

10.1 Packaging -Cover Tape

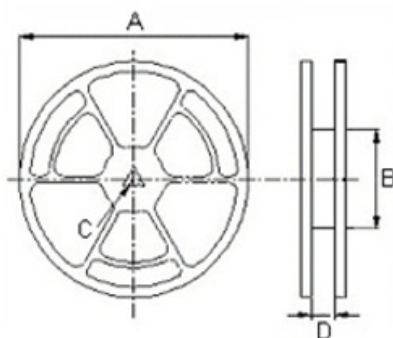
The force for tearing off cover tape is 10 to 130 grams in the arrow direction.



10.2 Packaging Quantity

TYPE	PCS/REEL
060545	1500

10.3 Reel Dimensions

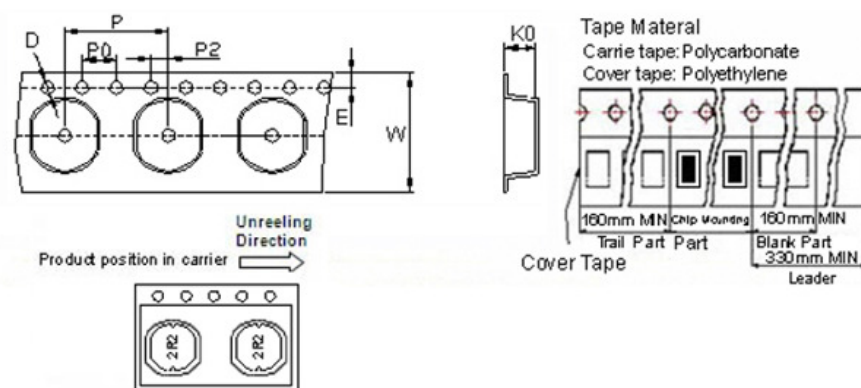


Dimensions in mm

TYPE	A	B	C	D
060545	330	100	13	16

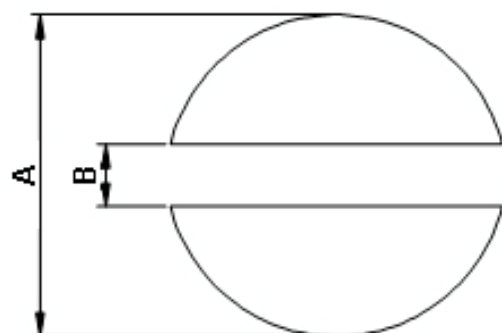
10 Packaging:

10.4 Tape Dimensions in mm



TYPE	K0	D	E	W	P	P0	P2
060545	4.80	1.55	1.75	16	8	4	2

11 Recommended Land Pattern:



Dimensions in mm

TYPE	A	B
060545	6.8	1.3

12 Note:

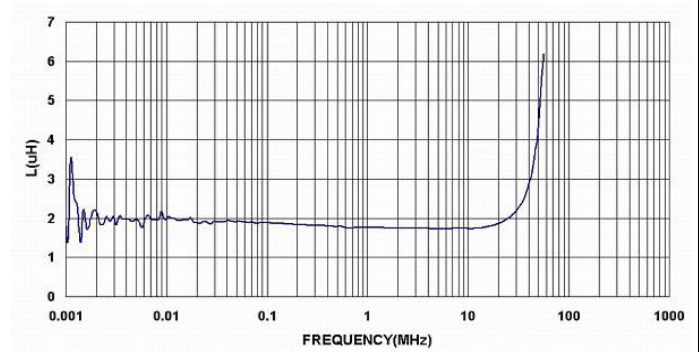
1. Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.
2. Do not knock nor drop.
3. All the items and parameters in this product specification have been prescribed on the premise that our product is used for the 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.
4. Please keep the distance between transformer/coil and other components (refer to the standard IEC 950)
5. The moisture sensitivity level (MSL) of products is classified as level 1.

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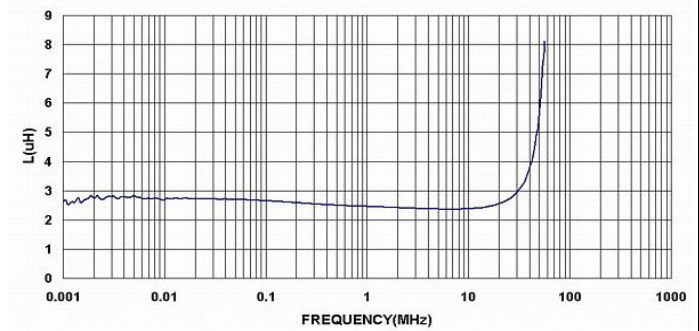
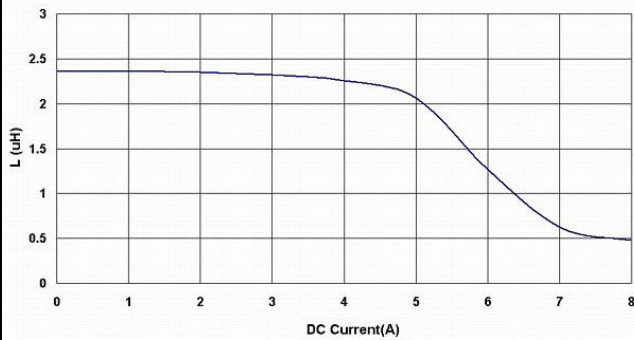
AEC-Q200

13 Graph:

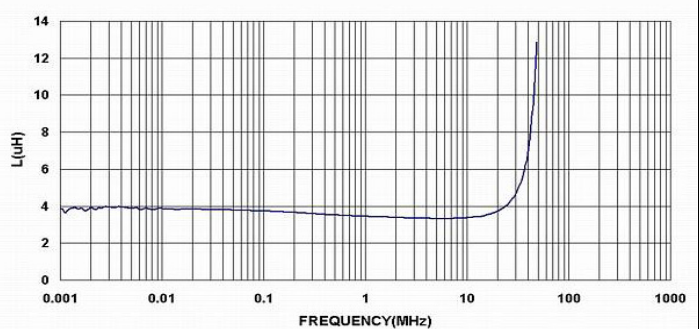
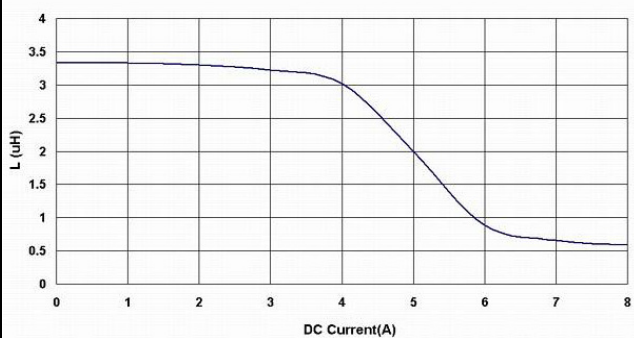
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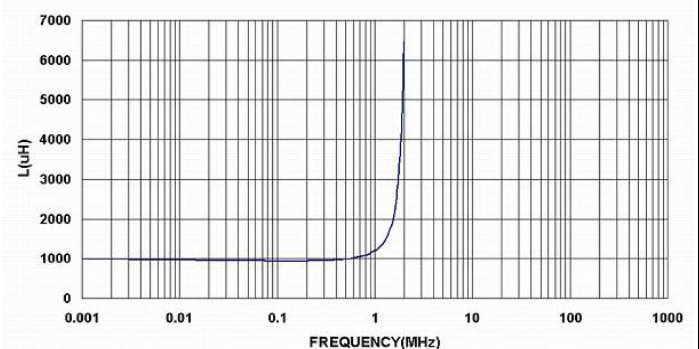
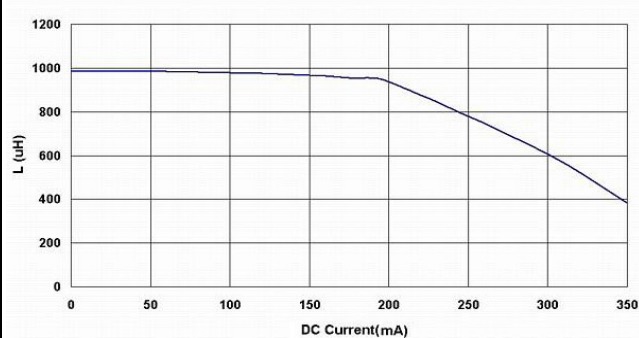
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APSD000605453R3□00



APSD00060545102□00

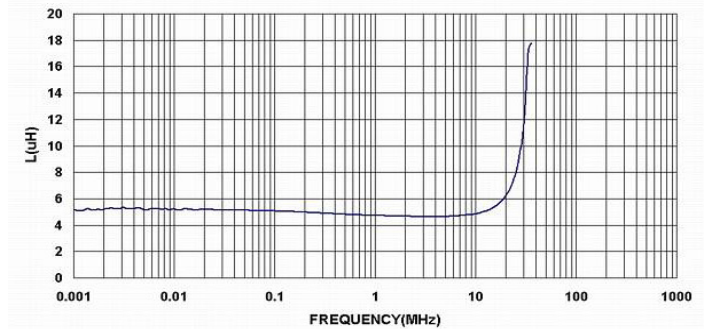
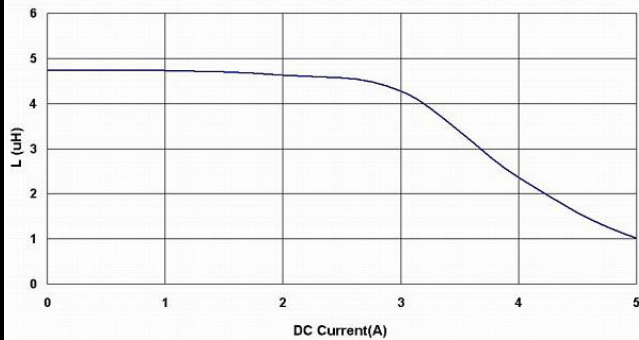


APSD00060545 Series Specification

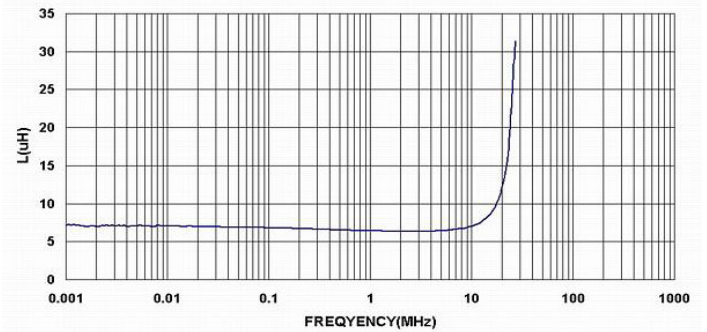
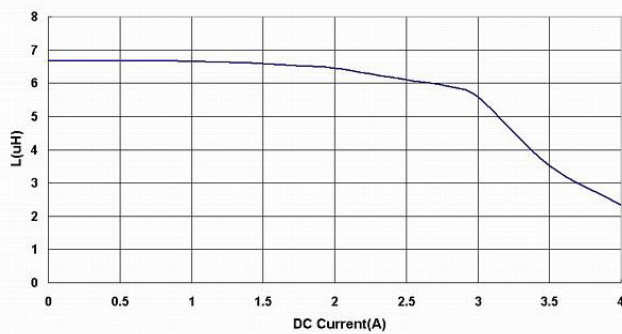
AEC-Q200

13 Graph:

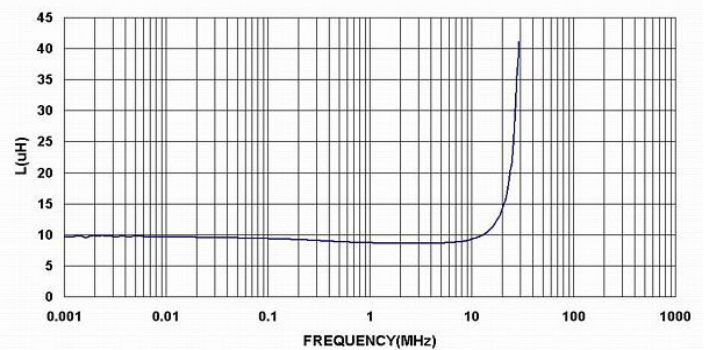
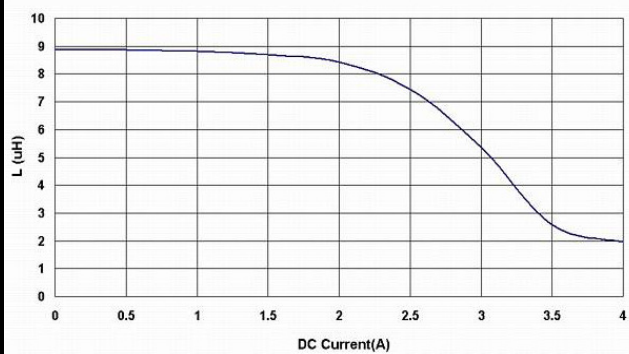
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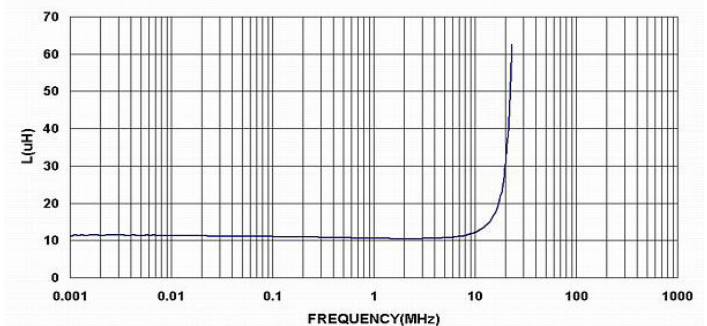
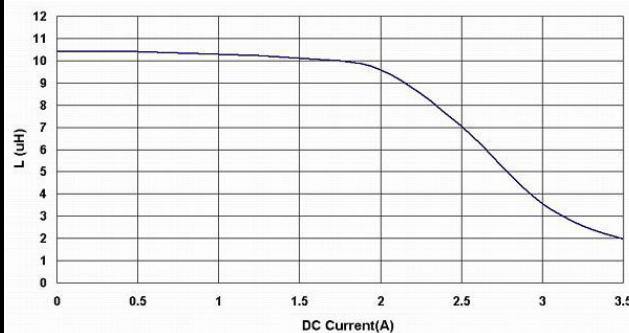
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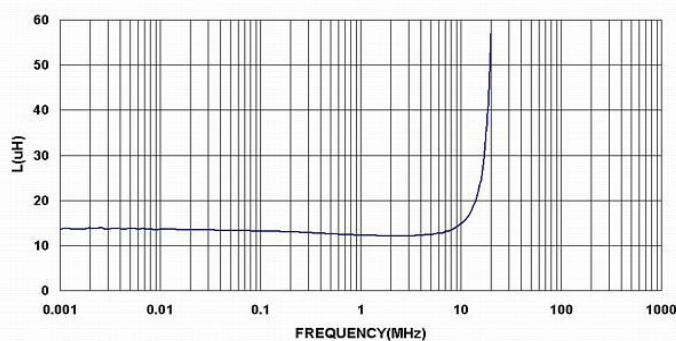
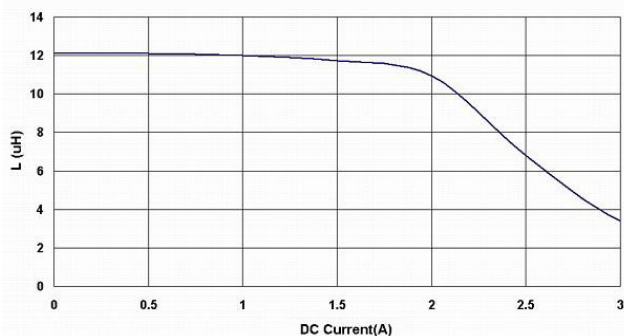


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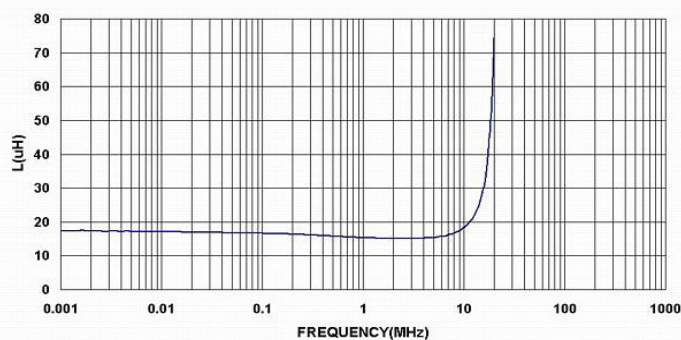
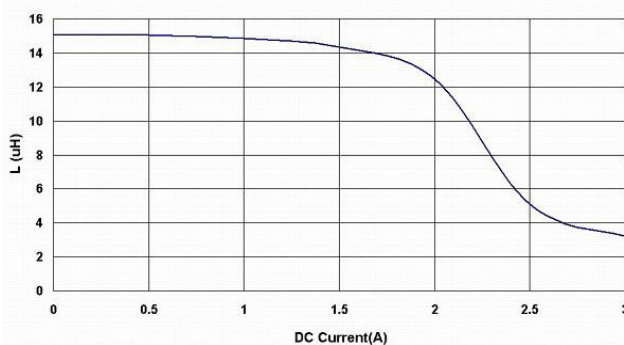
AEC-Q200

13 Graph:

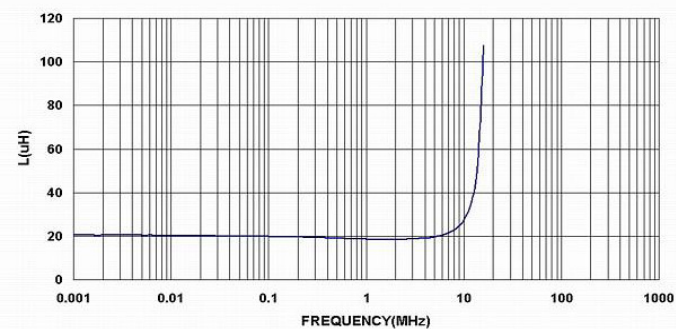
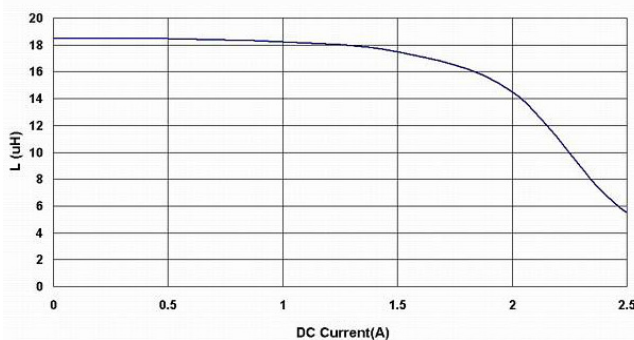
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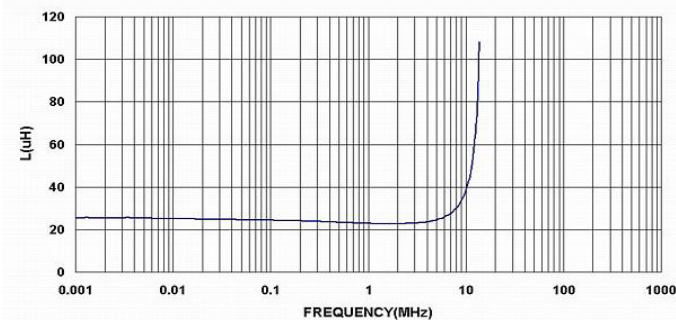
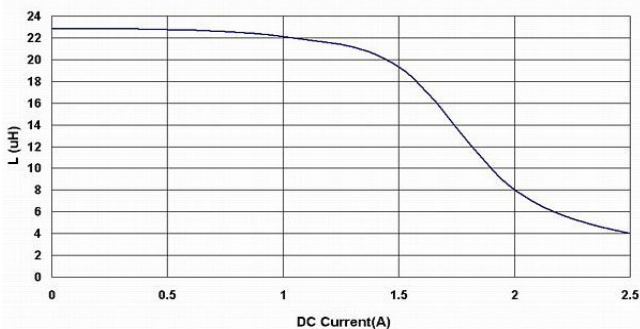
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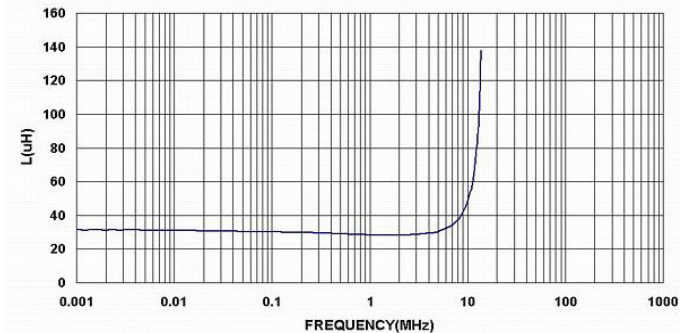
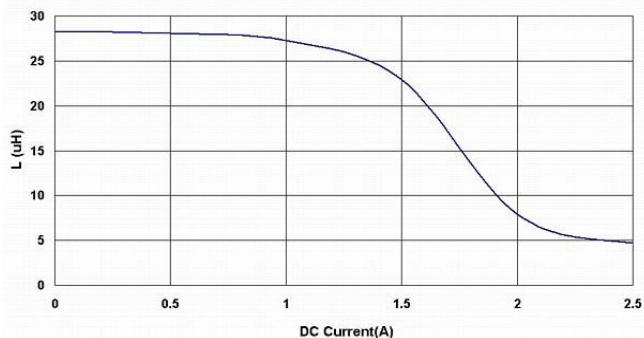


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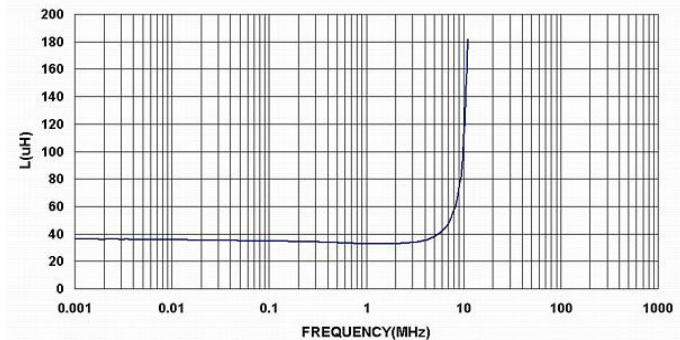
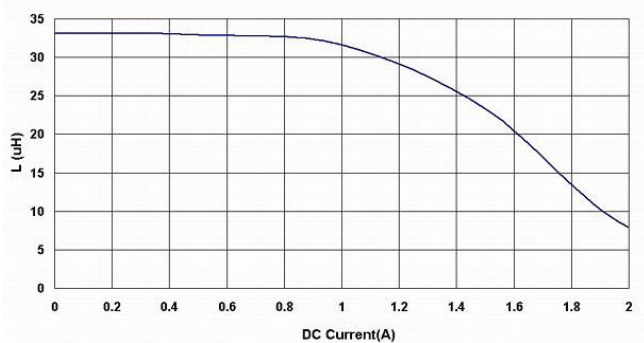
AEC-Q200

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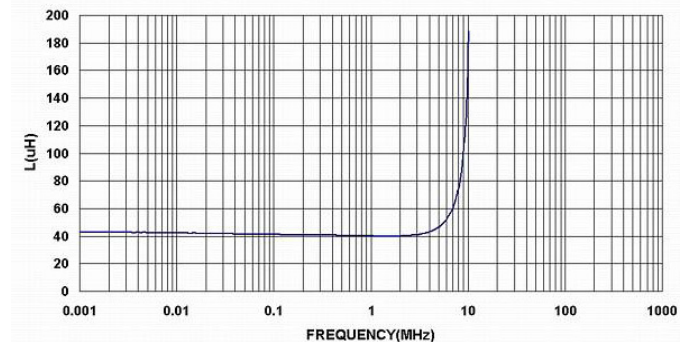
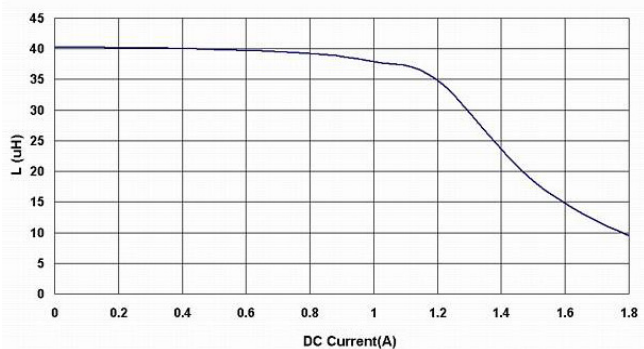
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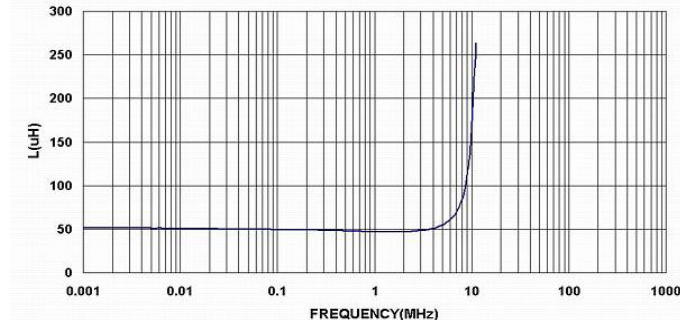
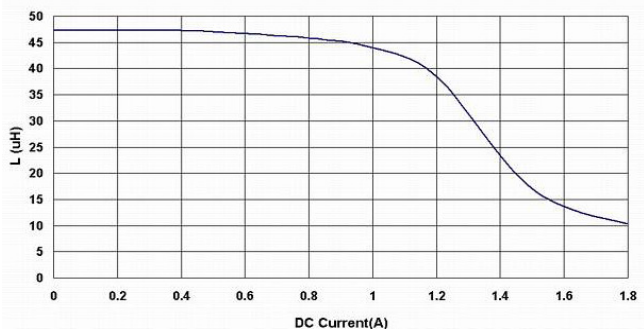
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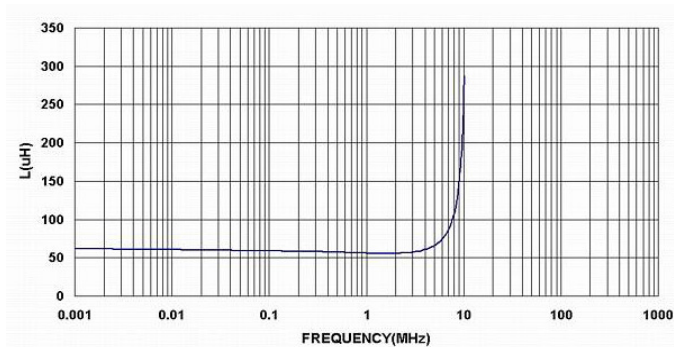
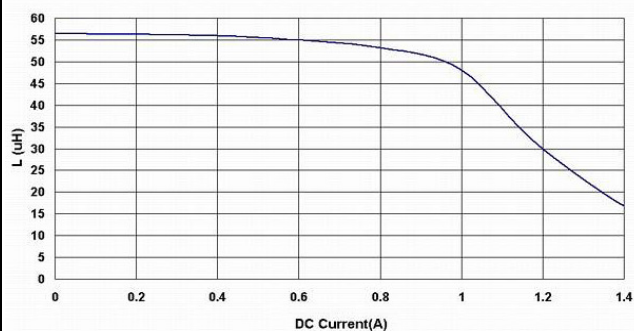


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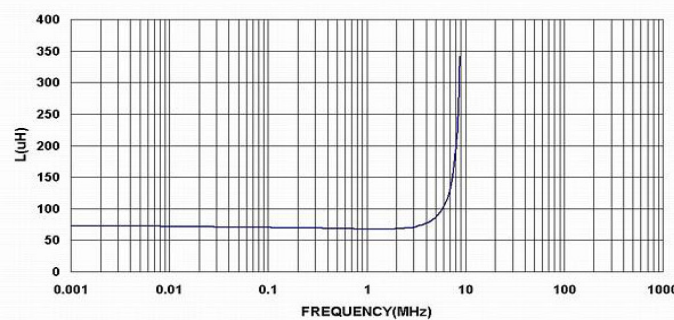
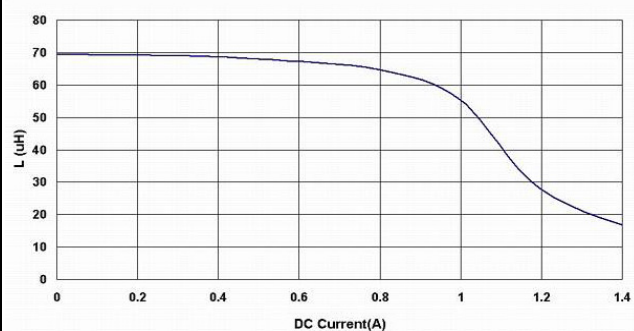
AEC-Q200

13 Graph:

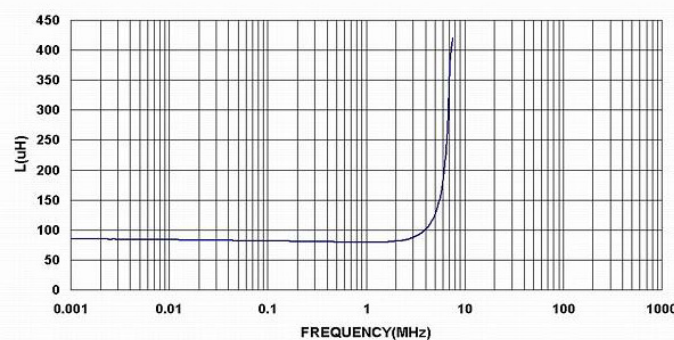
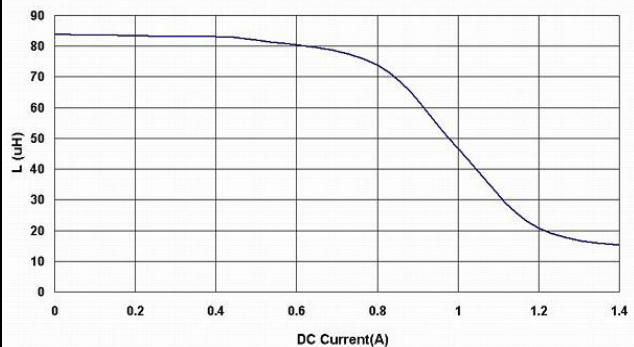
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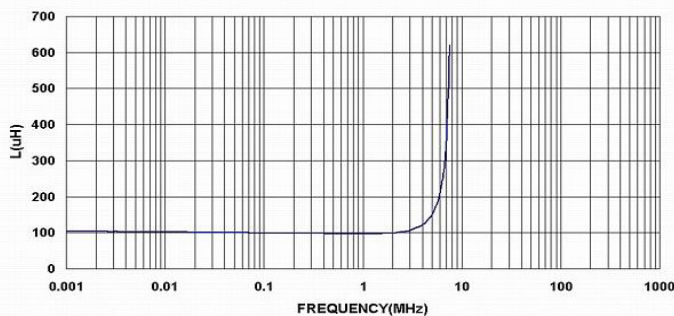
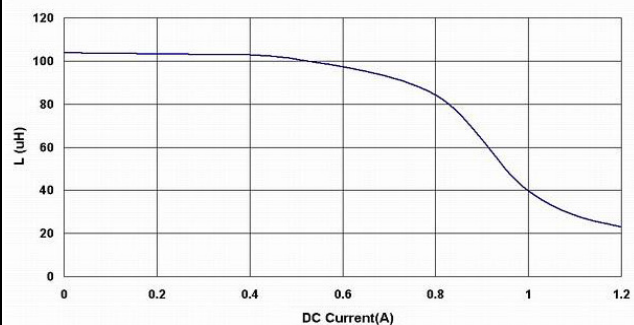
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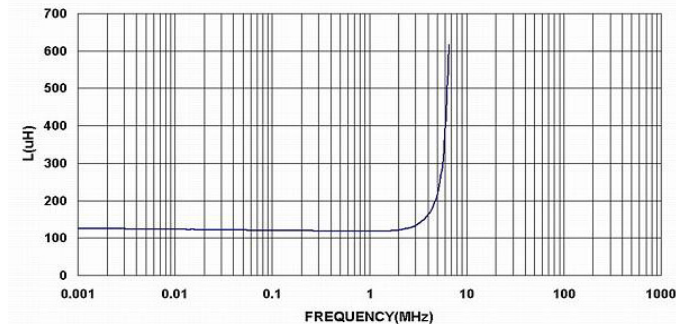
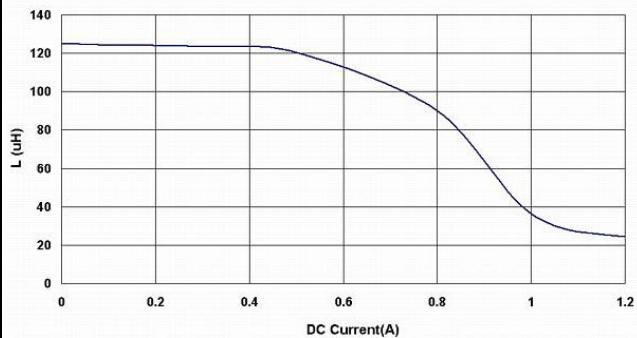


APSD00060545 Series Specification

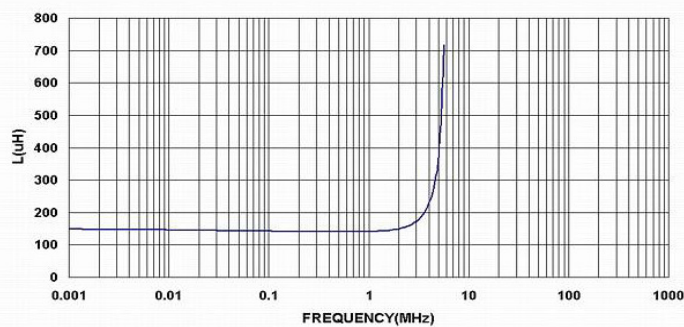
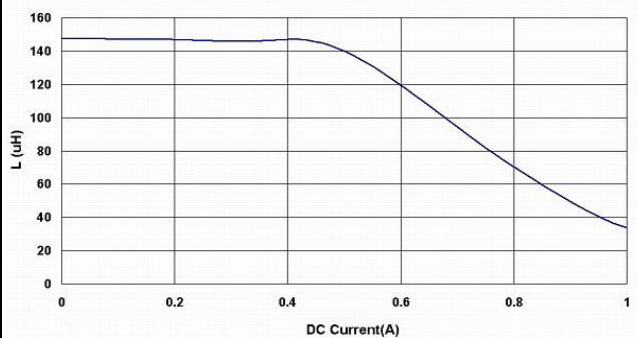
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13 Graph:

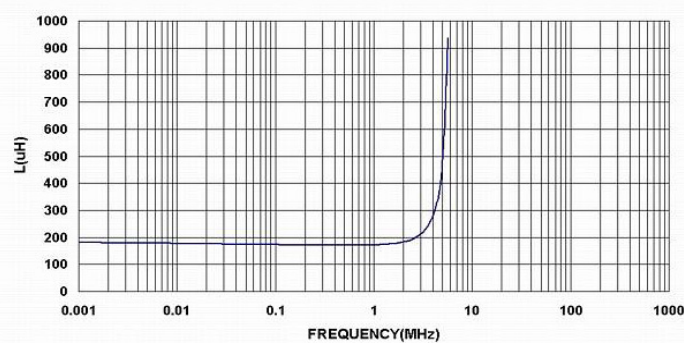
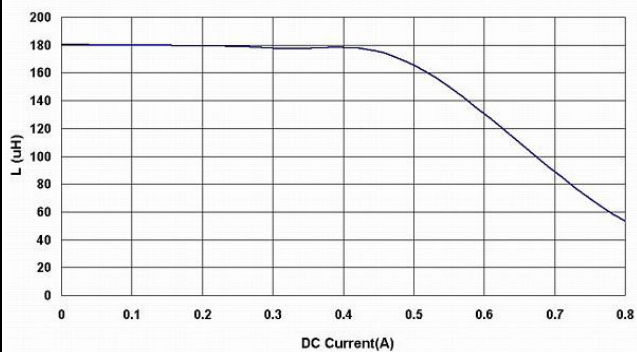
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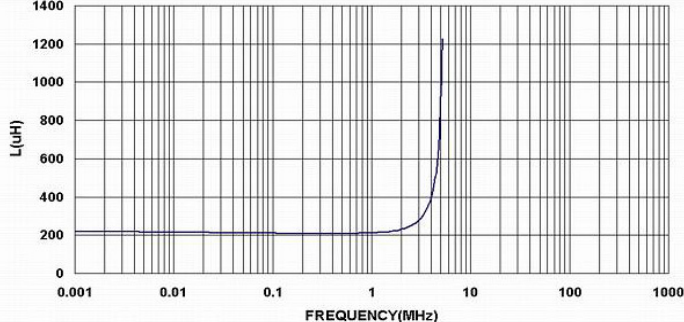
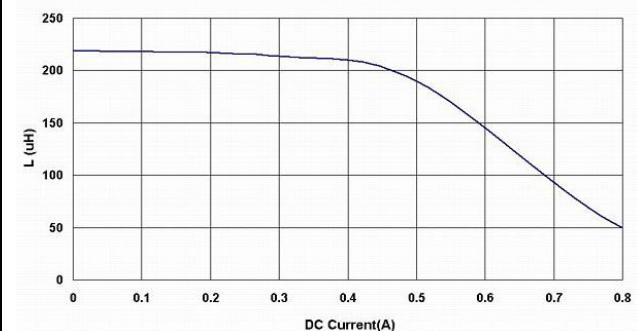
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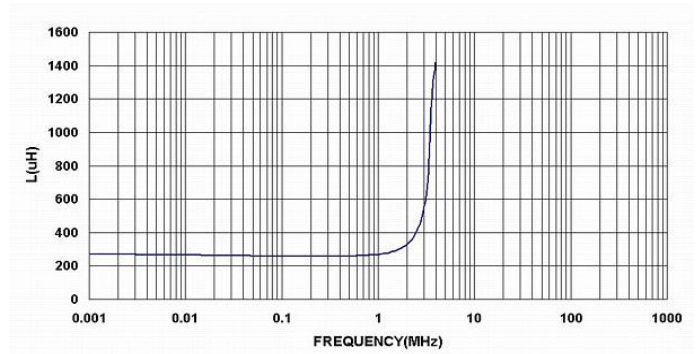
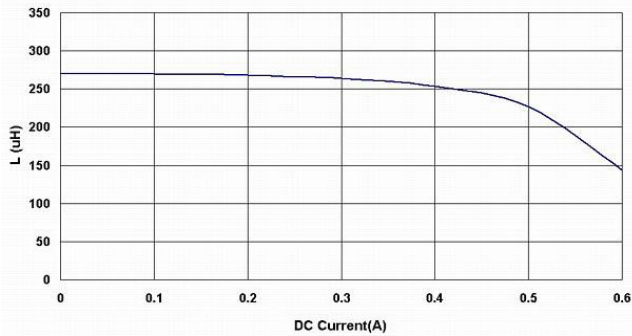


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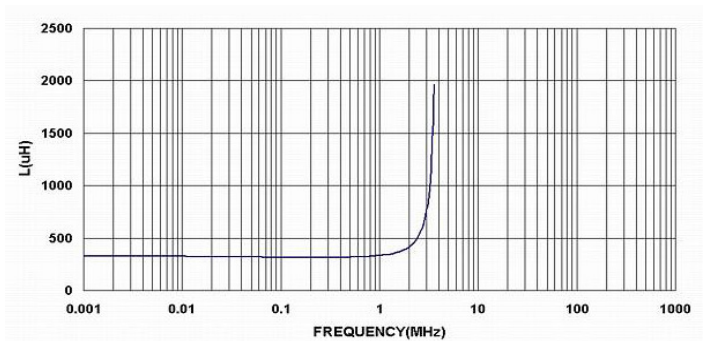
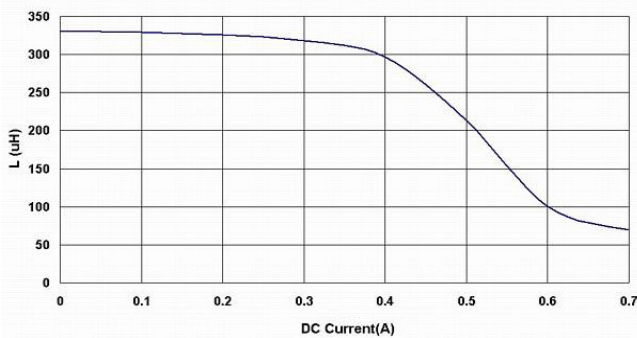
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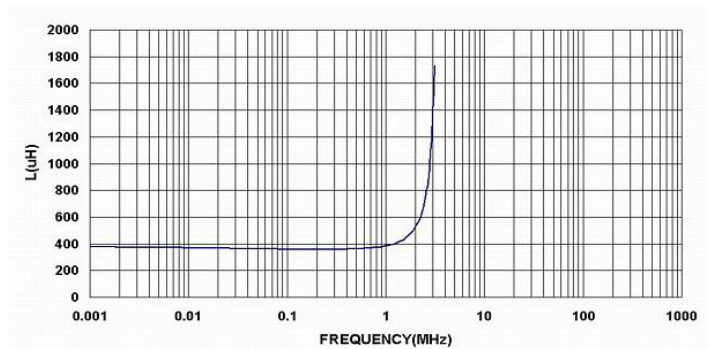
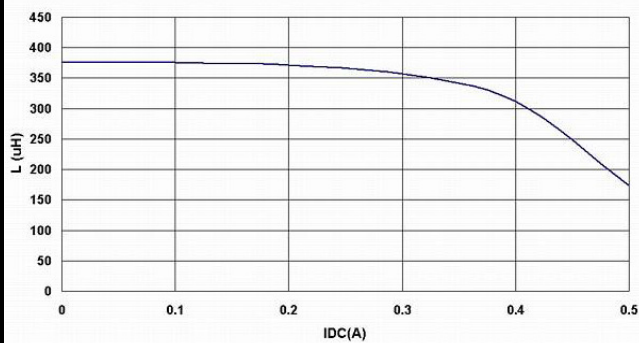
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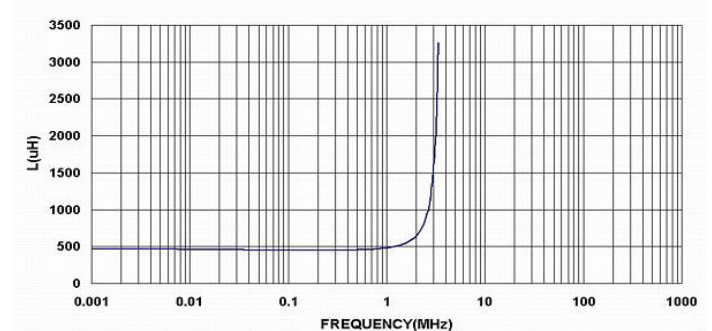
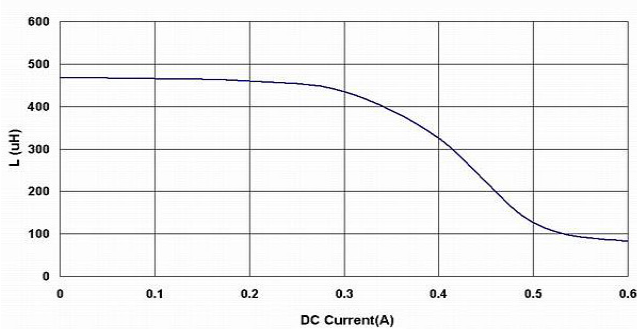
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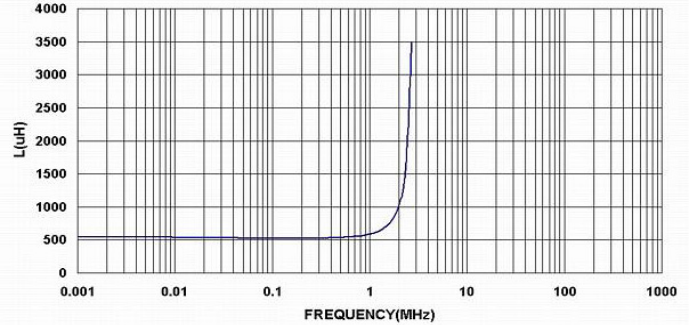
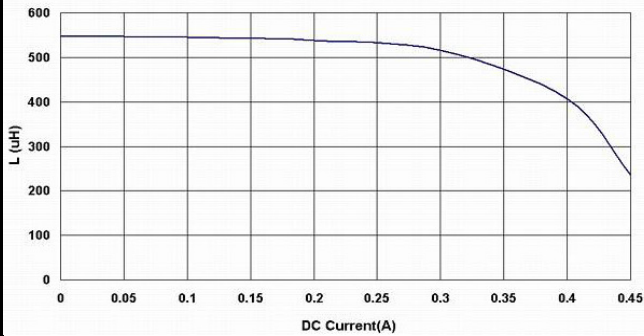


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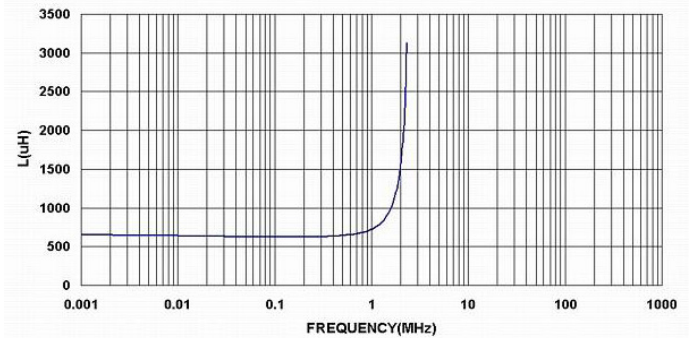
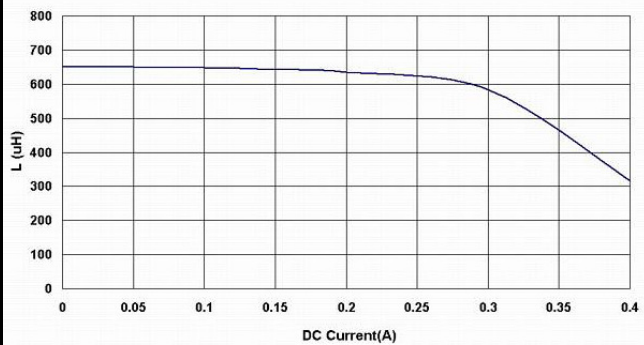
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