

Power Inductor

Automotive Grade

APCI 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. Ferrite SMD Shielded Type
3. No thermal aging

Applications

1. Automotive Systems for Infotainment, Dashboard, ADAS
2. IPC Equipment
3. Net working

Product Information

Series	L (mm)	W(mm)	T (mm)	Inductance (μH)
APCI	7.3	7.3	4.6	0.33 ~ 10000
	12.0	12.0	5.0	
	12.0	12.0	6.0	
	12.0	12.0	8.0	
	12.0	12.0	10.0	

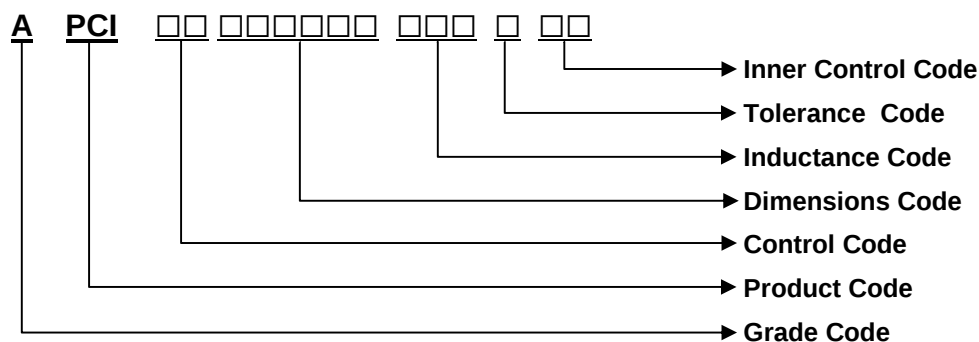


APCI00121280 Series Specification

AEC-Q200

1 Scope: This specification applies to the Pb Free high current type SMD inductors

2 Part Numbering:



3 Rating:

Operating Temperature: - 55°C ~ + 150°C (Including self temp. rise)

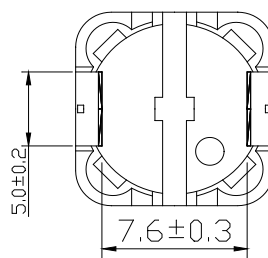
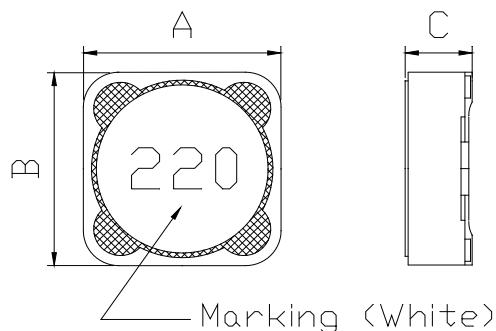
Storage Temperature: - 55°C ~ + 150°C (For after the circuit board is mounted)

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

4 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

5 Configuration and Dimensions:



A: 12.0±0.5 mm

B: 12.0±0.5 mm

C: 8.0 Max. mm

Net Weight (grms)

SIZE CODE	Net Weight (grms)
121280	4.19(Typ.)

APCI00121280 Series Specification

AEC-Q200

6 Electrical Characteristics:

Part No.	Inductance L(μH)	Test Frequency	Resistance RDC(Ω) Max.	Rated DC Current		Tolerance	Marking
				Isat(A)	Irms(A)		
APCI001212801R0□80	1.0	100kHz/0.25V	5.5m	18.00	15.00	T	1R0
APCI001212802R2□80	2.2	100kHz/0.25V	6.2m	16.00	13.00	T	2R2
APCI001212803R3□80	3.3	100kHz/0.25V	13.5m	13.50	7.50	M,T	3R3
APCI001212804R5□80	4.5	100kHz/0.25V	15.8m	11.50	6.80	M,T	4R5
APCI001212804R7□80	4.7	100kHz/0.25V	15.8m	11.50	6.80	M,T	4R7
APCI001212805R6□80	5.6	100kHz/0.25V	16.8m	10.50	6.70	M,T	5R6
APCI001212806R5□80	6.5	100kHz/0.25V	17.6m	9.50	6.60	M,T	6R5
APCI001212806R8□80	6.8	100kHz/0.25V	17.6m	9.50	6.60	M,T	6R8
APCI001212807R6□80	7.6	100kHz/0.25V	20.0m	9.00	6.00	M,T	7R6
APCI00121280100□80	10	100kHz/0.25V	21.6m	7.80	5.40	M,T	100
APCI00121280120□80	12	100kHz/0.25V	24.3m	7.30	4.90	M,T	120
APCI00121280130□80	13	100kHz/0.25V	24.3m	7.30	4.90	M,T	130
APCI00121280150□80	15	100kHz/0.25V	27.0m	6.50	4.50	M,T	150
APCI00121280180□80	18	100kHz/0.25V	39.2m	6.00	3.90	M,T	180
APCI00121280220□80	22	100kHz/0.25V	43.2m	5.30	3.60	M,T	220
APCI00121280270□80	27	100kHz/0.25V	53.1m	4.80	3.30	M,T	270
APCI00121280330□80	33	100kHz/0.25V	64.8m	4.30	3.00	M,T	330
APCI00121280390□80	39	100kHz/0.25V	71.0m	4.10	2.80	M,T	390
APCI00121280470□80	47	100kHz/0.25V	0.10	3.80	2.50	M,T	470
APCI00121280560□80	56	100kHz/0.25V	0.11	3.40	2.35	M,T	560
APCI00121280680□80	68	100kHz/0.25V	0.14	3.10	2.10	M,T	680
APCI00121280820□80	82	100kHz/0.25V	0.16	2.70	1.95	M,T	820
APCI00121280101□80	100	100kHz/0.25V	0.22	2.50	1.70	M,T	101
APCI00121280121□80	120	100kHz/0.25V	0.25	2.30	1.60	M,T	121
APCI00121280151□80	150	100kHz/0.25V	0.28	2.00	1.42	M,T	151
APCI00121280181□80	180	100kHz/0.25V	0.35	1.90	1.30	M,T	181
APCI00121280201□80	200	100kHz/0.25V	0.37	1.80	1.23	M,T	201
APCI00121280221□80	220	100kHz/0.25V	0.39	1.70	1.16	M,T	221

NOTE: tolerance M=±20% , T=±30%

1. Isat : Based on inductance change (ΔL/Lo : drop 25% Max.) @ambient temperature 25°C
2. Irms : Based on temperature rise (ΔT : 40°C TYP.)
3. Breakdown voltage : 400Vac Max. (Inductance 680uH~10mH)

APCI00121280 Series Specification

AEC-Q200

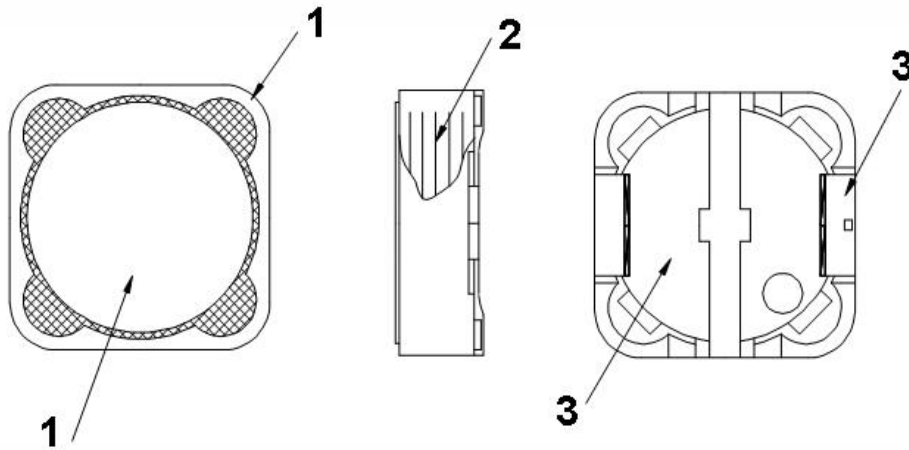
6 Electrical Characteristics:

Part No.	Inductance L(μH)	Test Frequency	Resistance RDC(Ω) Max.	Rated DC Current		Tolerance	Marking
				Isat(A)	Irms(A)		
APCI00121280271□80	270	100kHz/0.25V	0.51	1.60	1.06	M,T	271
APCI00121280281□80	280	100kHz/0.25V	0.51	1.60	1.06	M,T	281
APCI00121280331□80	330	100kHz/0.25V	0.64	1.40	0.95	M,T	331
APCI00121280391□80	390	100kHz/0.25V	0.70	1.30	0.88	M,T	391
APCI00121280471□80	470	100kHz/0.25V	0.98	1.10	0.79	M,T	471
APCI00121280561□80	560	100kHz/0.25V	1.03	1.05	0.75	M,T	561
APCI00121280681□80	680	100kHz/0.25V	1.10	1.00	0.70	M	681
APCI00121280801□80	800	100kHz/0.25V	1.29	0.90	0.67	M	801
APCI00121280821□80	820	100kHz/0.25V	1.29	0.90	0.67	M	821
APCI00121280102□80	1000	100kHz/0.25V	1.53	0.85	0.64	K,M	102
APCI00121280112□80	1100	100kHz/0.25V	1.66	0.82	0.62	M	112
APCI00121280122□80	1200	100kHz/0.25V	1.80	0.80	0.60	M	122
APCI00121280132□80	1300	100kHz/0.25V	1.93	0.76	0.58	M	132
APCI00121280142□80	1400	100kHz/0.25V	2.10	0.73	0.56	K,M	142
APCI00121280152□80	1500	100kHz/0.25V	2.20	0.70	0.55	M	152
APCI00121280182□80	1800	10kHz/0.25V	2.50	0.65	0.50	M	182
APCI00121280202□80	2000	10kHz/0.25V	2.70	0.62	0.48	M	202
APCI00121280222□80	2200	10kHz/0.25V	2.90	0.59	0.46	M	222
APCI00121280242□80	2400	10kHz/0.25V	3.20	0.58	0.45	M	242
APCI00121280282□80	2800	10kHz/0.25V	3.60	0.53	0.42	M	282
APCI00121280332□80	3300	10kHz/0.25V	4.10	0.48	0.39	M	332
APCI00121280392□80	3900	10kHz/0.25V	4.70	0.45	0.37	M	392
APCI00121280472□80	4700	10kHz/0.25V	5.30	0.42	0.36	M	472
APCI00121280622□80	6200	10kHz/0.25V	7.10	0.33	0.30	K,M	622
APCI00121280682□80	6800	10kHz/0.25V	7.20	0.30	0.28	M	682
APCI00121280103□80	10000	10kHz/0.25V	14.20	0.15	0.15	M	103

NOTE: tolerance M=±20% , T=±30%

1. Isat : Based on inductance change ($\Delta L/L_0$: drop 25% Max.) @ambient temperature 25℃
2. Irms : Based on temperature rise (ΔT : 40℃ TYP.)
3. Breakdown voltage : 400Vac Max. (Inductance 680uH~10mH)

6.1 Construction:



6.2 Material List:

NO.	ITEM	DESCRIPTION & TYPE
1	CORE	FERRITE
2	WIRE	MAGNET WIRE (P180)
3	TERMINAL	Ag/Cu/Ni/Sn

APCI00121280 Series Specification

AEC-Q200

ELECTRICAL

TEST ITEM	SPECIFICATION	TEST DETAILS
Temperature characteristics	$\Delta L/L20^{\circ}\text{C} \leq \pm 10\%$ 0 ~ 2000 ppm/ $^{\circ}\text{C}$	The test shall be performed after the sample has stabilized in an ambient temperature of -20 to +85 $^{\circ}\text{C}$, and the value calculated based on the value applicable in a normal temperature and normal humidity shall be $\Delta L/L20^{\circ}\text{C} \leq \pm 10\%$.

MECHANICAL

TEST ITEM	SPECIFICATION	TEST DETAILS
High Temperature Exposure (Storage)	1. $\Delta L/L_0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	Refer to MIL-STD-202 Method 108 1. preconditioning : reflow 3 times. 2. 1000hrs. at rated operating temperature, part can be stored for 1000 hrs. @ 150 $^{\circ}\text{C}$. Unpowered. Measurement at 24 $\pm$ 4 hours after test conclusion.
Temperature Cycling	1. $\Delta L/L_0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	Refer to JESD22 Method JA-104 1. preconditioning : reflow 3 times. 2. 1000 cycles (-55 $^{\circ}\text{C}$ to +150 $^{\circ}\text{C}$). Measurement at 24 $\pm$ 4 hours after test conclusion. 30min maximum dwell time at each temperature extreme. 1 min. maximum transition time.
Biased Humidity	1. $\Delta L/L_0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	Refer to MIL-STD-202 Method 103 1. preconditioning : reflow 3 times. 2. 1000 hrs 85 $^{\circ}\text{C}$ /85%RH. Unpowered. Measurement at 24 $\pm$ 4 hours after test conclusion.
Operational Life	1. $\Delta L/L_0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	Refer to MIL-PRF-27 1. preconditioning : reflow 3 times. 2. 1000 hrs. @ 150 $^{\circ}\text{C}$. Measurement 24 $\pm$ 4 hours after test conclusion.
Physical Dimensions	Product spec	Refer to JESD22-B100 Verify physical dimensions to the applicable device detail specification.

APCI00121280 Series Specification

AEC-Q200

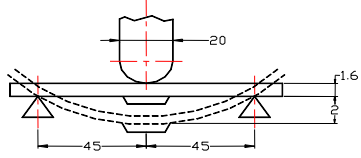
MECHANICAL

TEST ITEM	SPECIFICATION	TEST DETAILS
Resistance to Solvent	1. Marking -No constitute failure 2. No damage or degradation that has occurred due to solvent	Refer to MIL-STD-202 Method 215 Immersion 3+0.5/-0 minutes in Terpene defluxer. Brush 10 strokes (wet bristle) 2 to 3 oz. Rinse in water. Air blow dry.
Mechanical Shock	1. $\Delta L/L_0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	MIL-STD-202 Method 213 Units are non-operating. Pulse shape : Half-sine waveform Impact acceleration : 100 g's Pulse duration : 6 ms Number of shocks : 18 shocks (3 shocks for each face)
Vibration	1. $\Delta L/L_0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	MIL-STD-202 Method 204 5 g's for 20 minutes, 12 cycles each of 3 orientations. Test from 10-2000Hz.
Resistance to Soldering Heat (reflow soldering)	1. $\Delta L/L_0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	Temperature profile of reflow soldering Refer to MIL-STD-202 Method 210 SMD: Condition K, time above 217°C, 60s – 150s, 3Cycles
Solderability	All terminations shall exhibit a continuous solder coating free from defects for a minimum of 95% of the critical area of any individual termination.	Refer to J-STD-002 For both Leaded & SMD. Electrical Test not required. Test Method B @ 245±5°C, dwell for 5+0/-0.5 seconds

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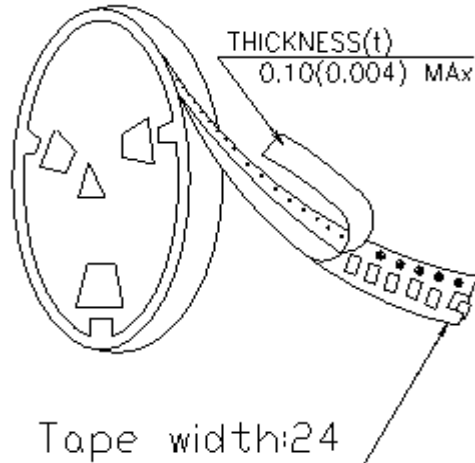
AEC-Q200

MECHANICAL

TEST ITEM	SPECIFICATION	TEST DETAILS
Board Flex	1. $\Delta L/L_0 \leq \pm 10\%$ 2. No Crack	Refer to AEC-Q200-005 Bend the board (D) X = 2mm, 60sec minimum holding time. 
Terminal Strength	1. $\Delta L/L_0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	Refer to AEC-Q200-006 Apply a 1.8Kg force to the side of a device bending tested. The force shall be applied for 60+1 seconds.
Electrical Characterization	User Specification.	Parametrically test per lot and sample size requirements. Summary to show minimum, maximum, mean and standard deviation at room, minimum and maximum operating temperatures.
ESD		Refer to AEC-Q200-002 or ISO/DIS 10605 Refer to attachment third party report
Flammability	The marking and A side have no obvious broken, and the marking are clearly	Refer to UL 94 Burning stops within 10 seconds on a vertical specimen; drips of particles allowed as long as they are not inflamed.

7 Packaging:

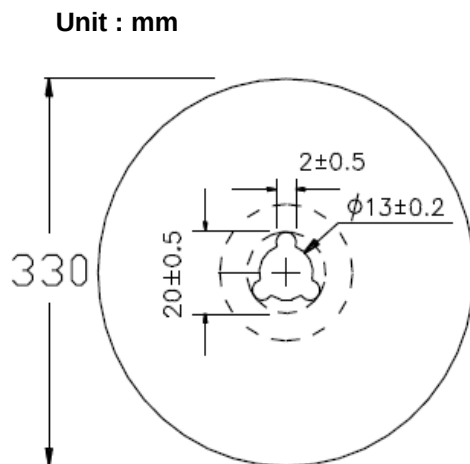
7.1 Packaging -Cover Tape



7.2 Packaging Quantity

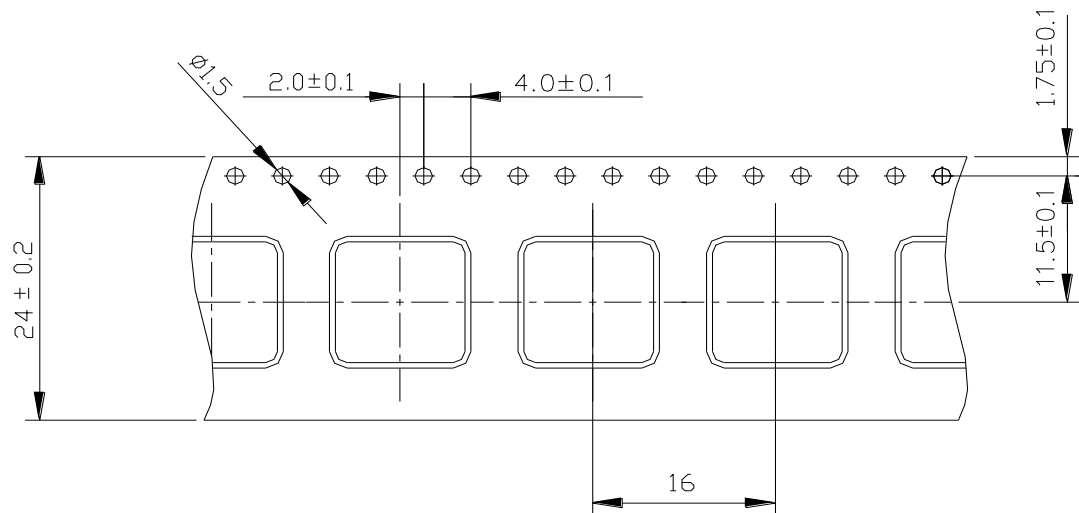
TYPE	PCS/REEL
APCI00121280	500

7.3 Reel Dimensions

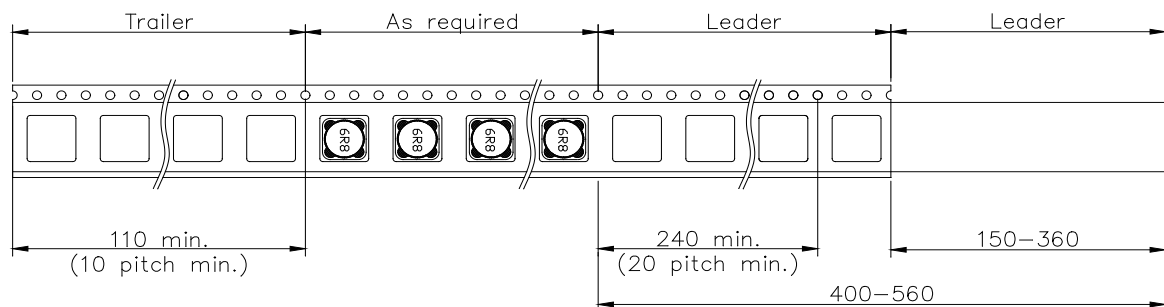
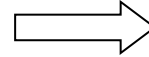


7 Packaging:

7.4 Tape Dimensions in mm

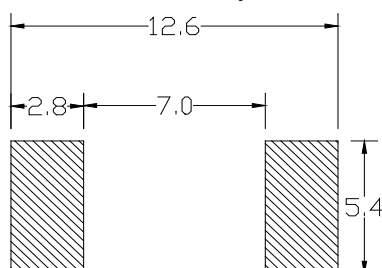


**Unreeling
Direction**



8 Recommended Land Pattern:

(STANDARD PATTERN) Unit : mm



9 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 or 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.
6. Suggestion

On customer side this product series need to be fixed by the glue after IR reflow.

Please refer to below example photo:



Glue

APCI00121280 Series Specification

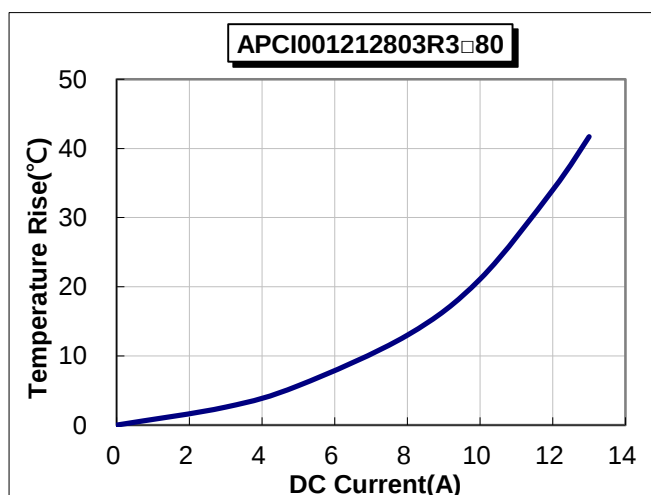
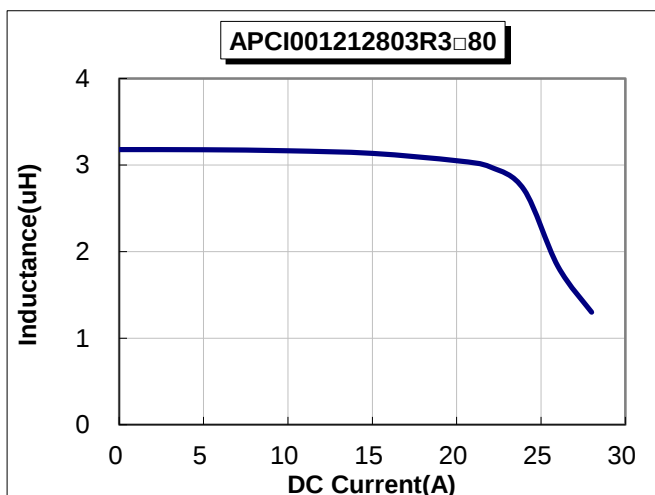
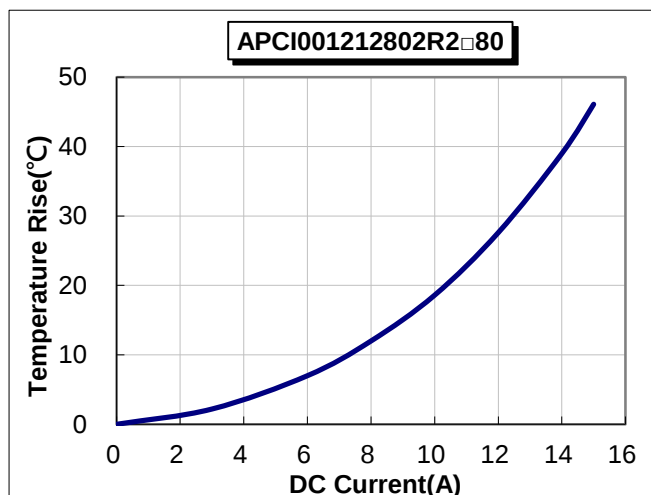
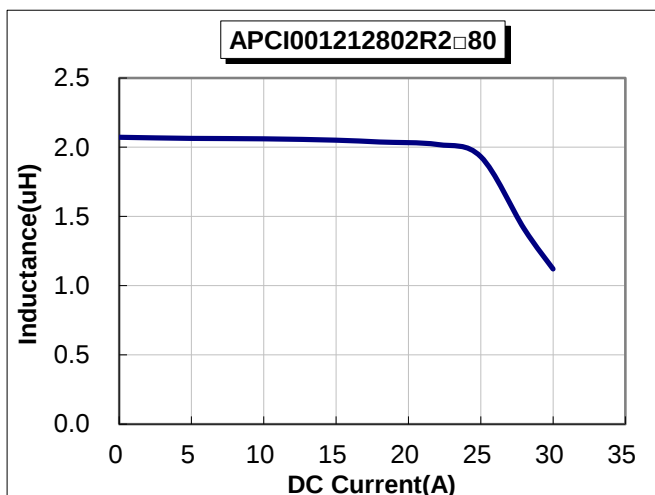
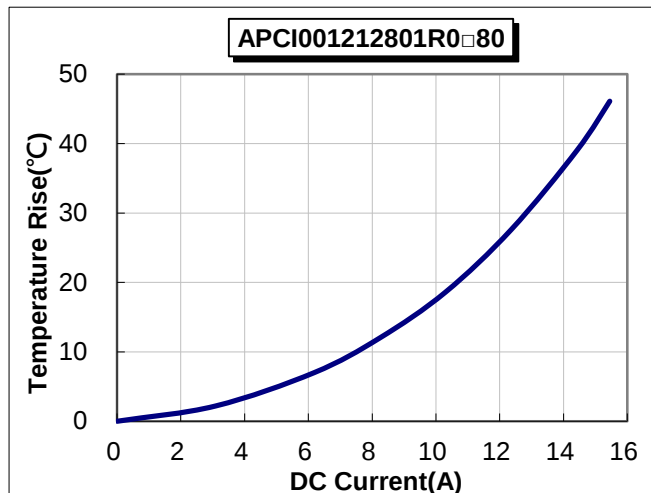
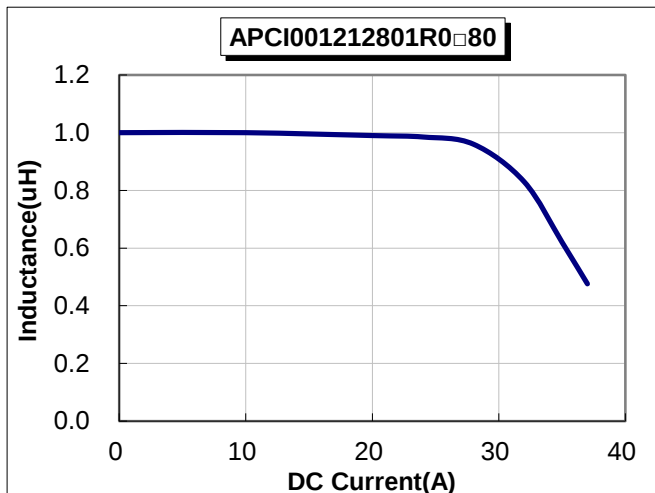
AEC-Q200

TYPICAL ELECTRICAL CHARACTERISTICS

INDUCTANCE vs. DC CURRENT

TEMPERATURE vs. DC CURRENT

@100KHz/0.25V Ambient Temperature : @25°C



APCI00121280 Series Specification

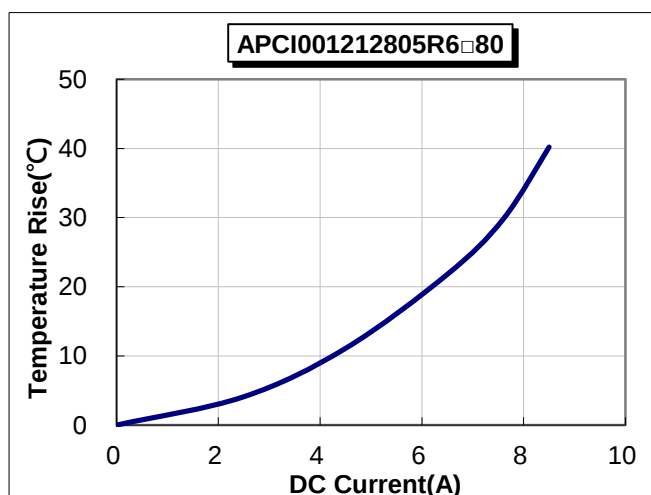
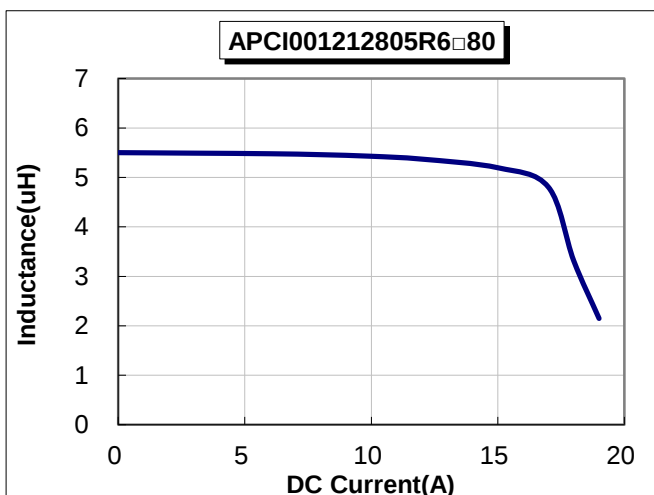
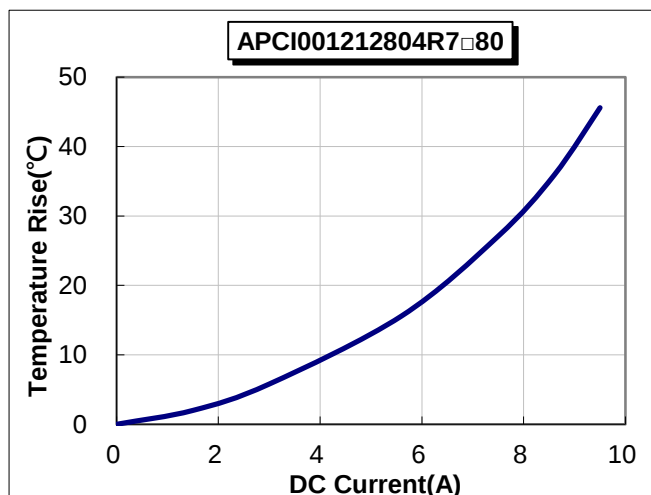
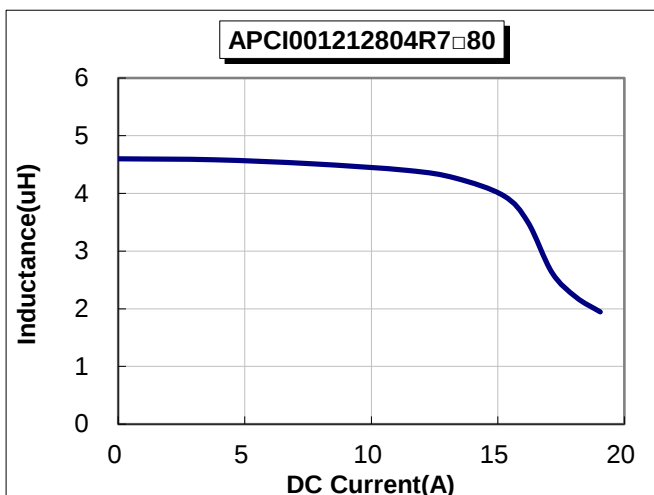
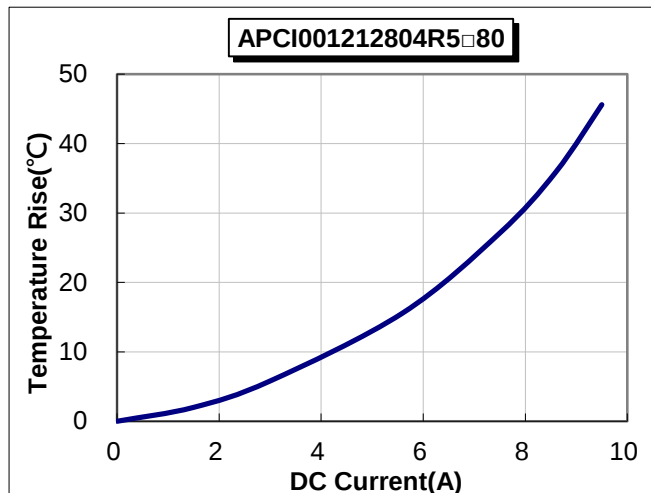
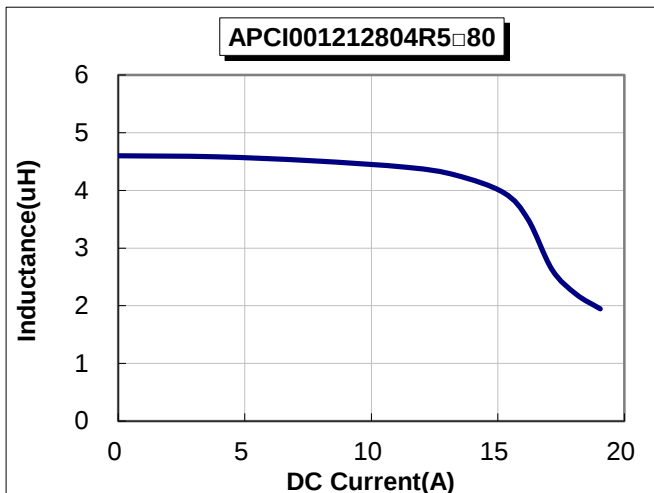
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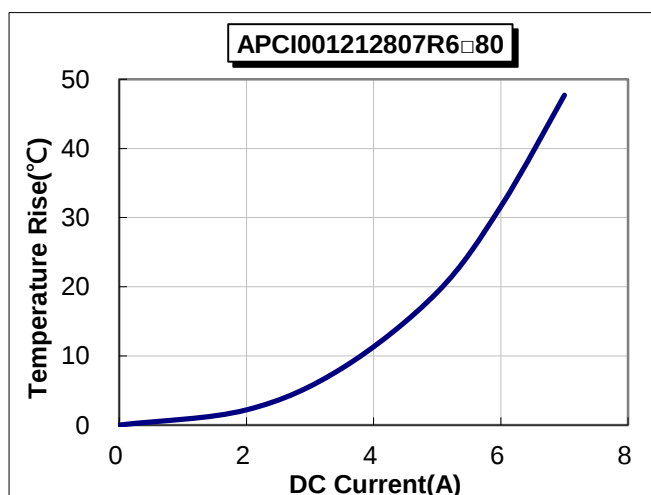
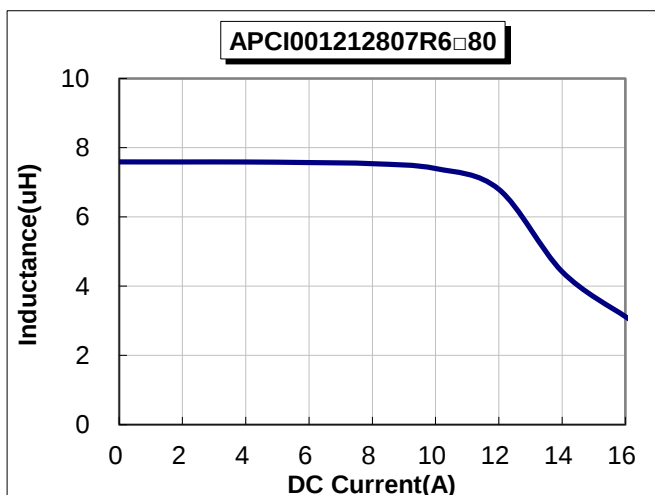
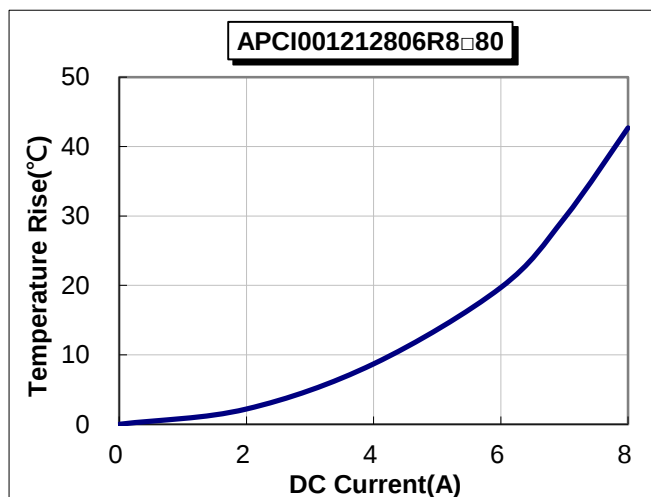
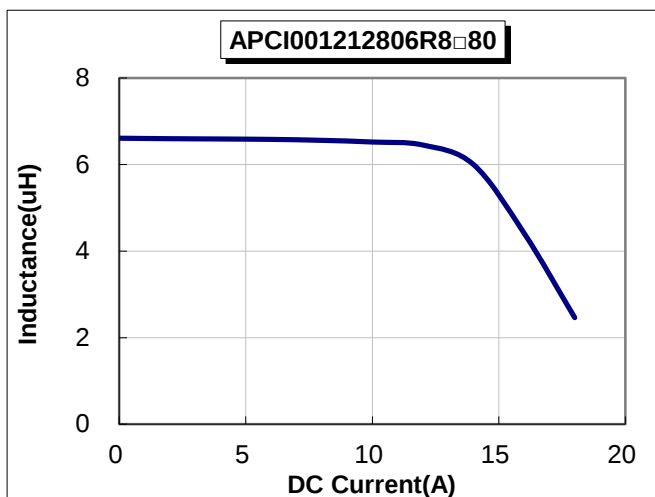
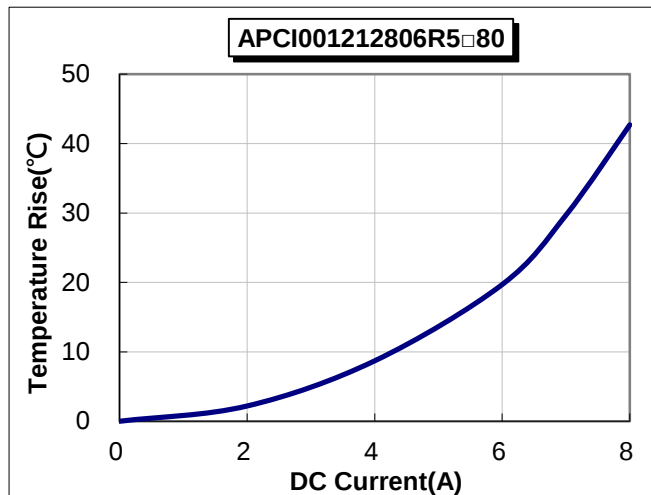
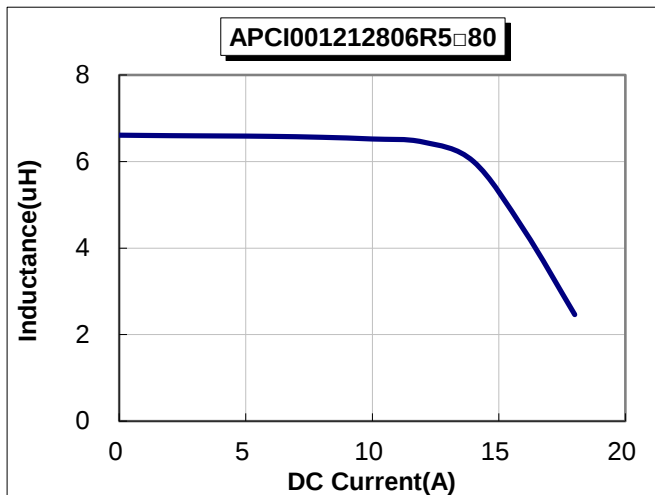
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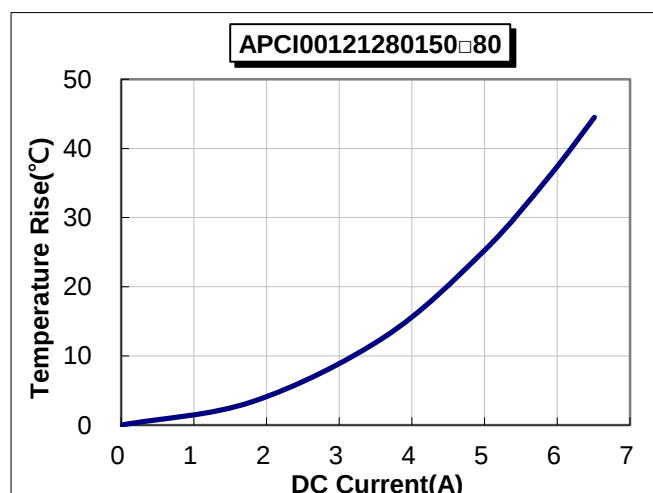
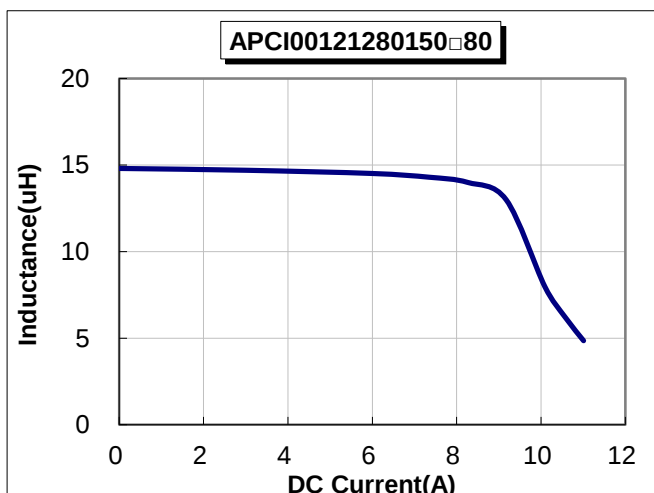
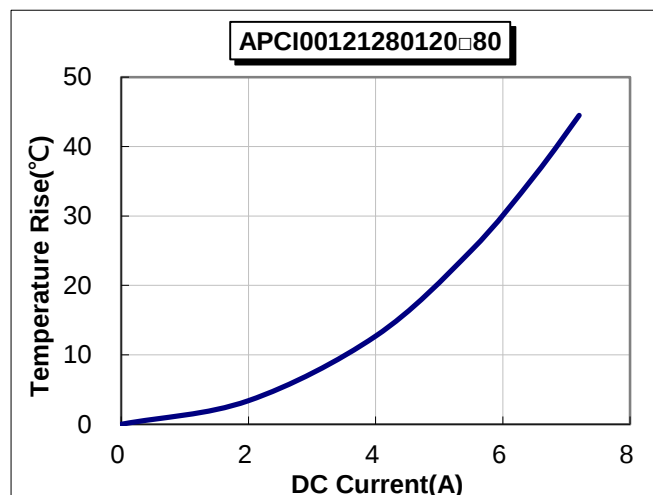
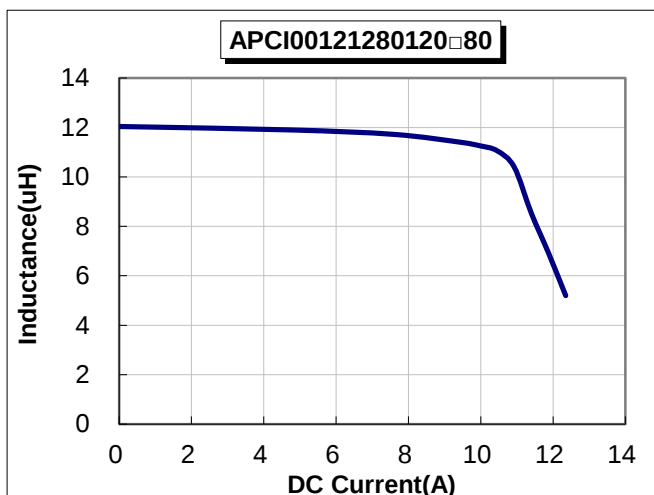
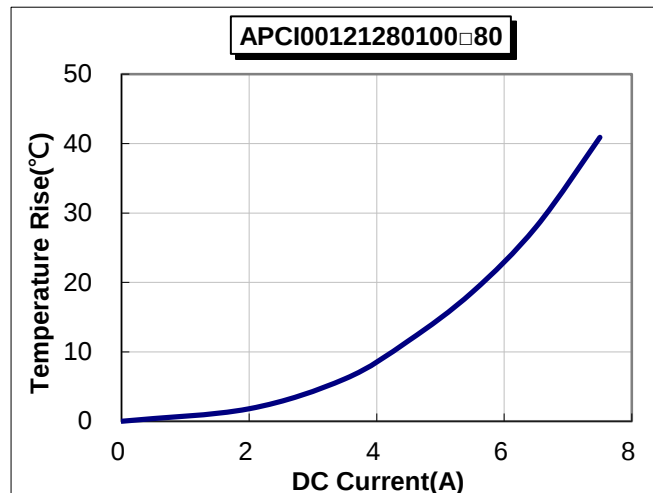
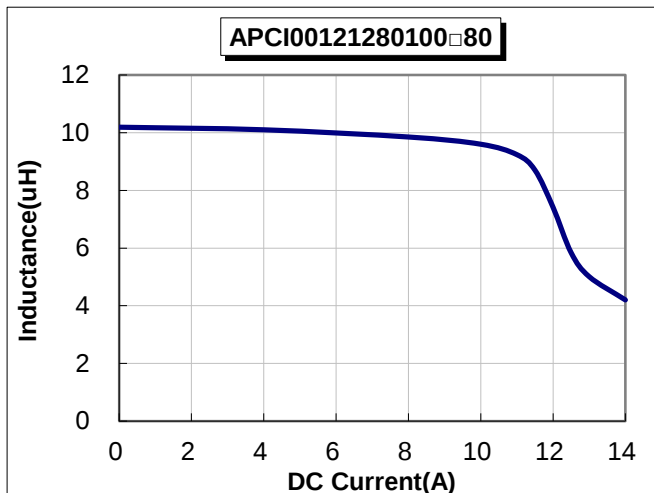
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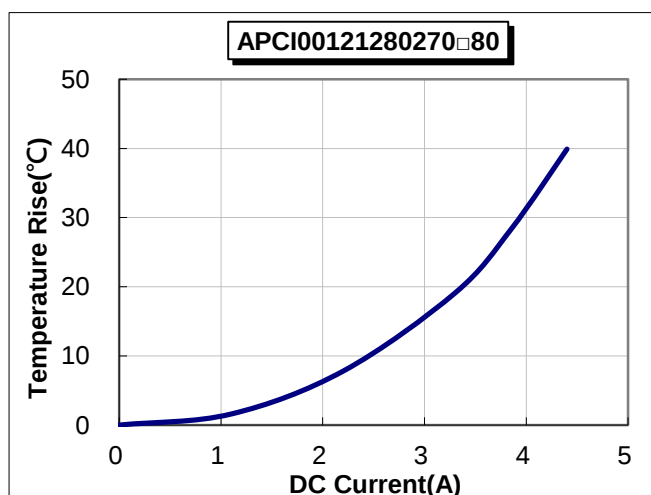
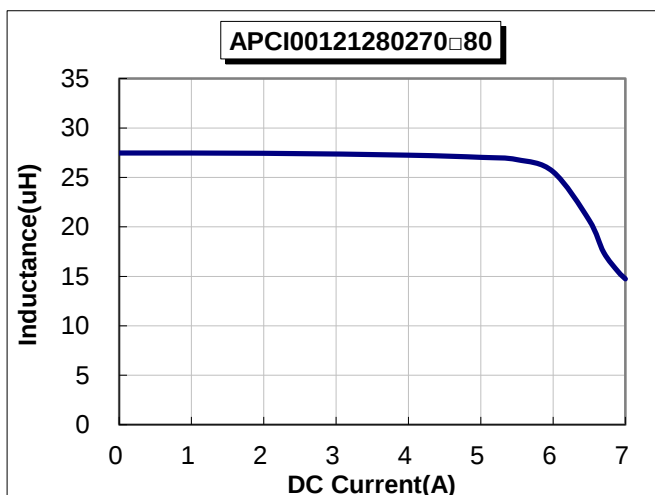
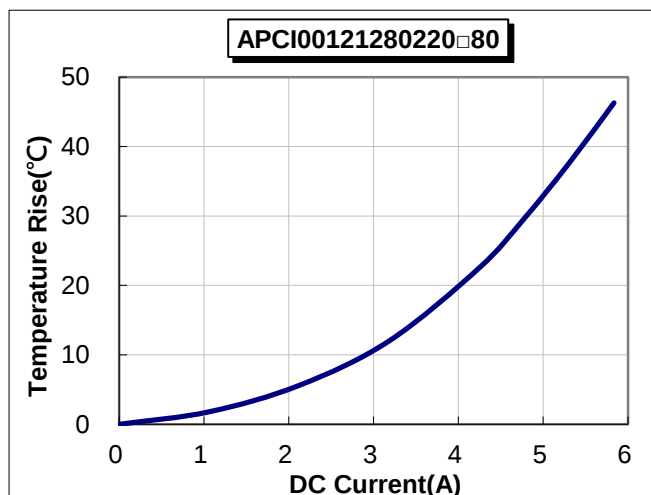
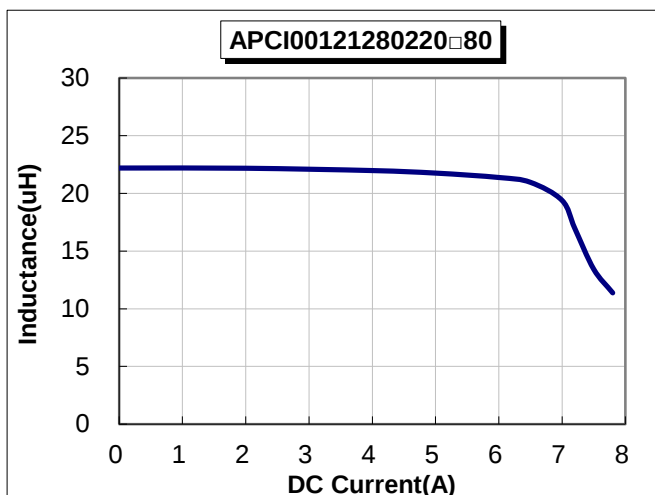
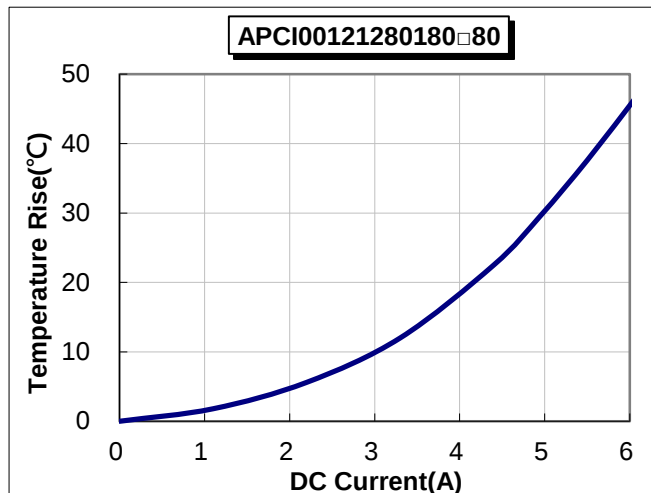
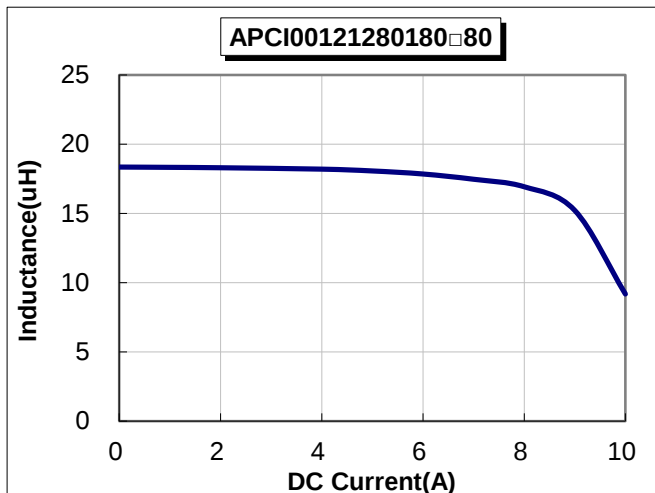
AEC-Q200

TYPICAL ELECTRICAL CHARACTERISTICS

INDUCTANCE vs. DC CURRENT

TEMPERATURE vs. DC CURRENT

@100KHz/0.25V Ambient Temperature : @25°C



APCI00121280 Series Specification

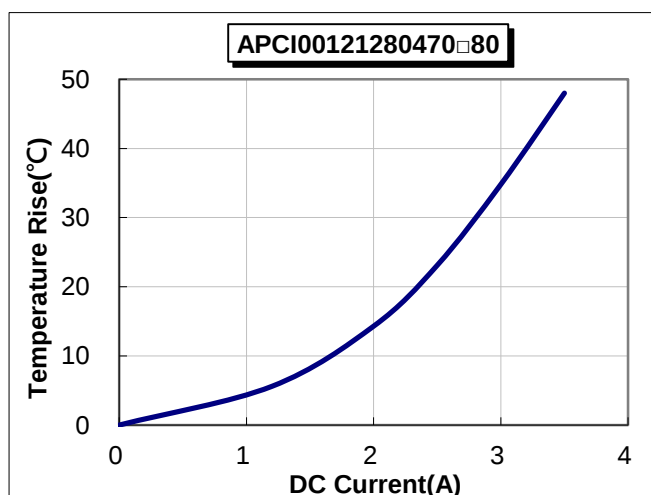
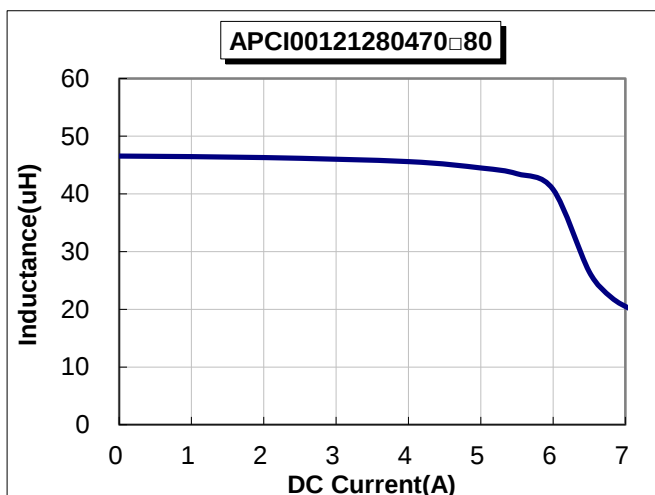
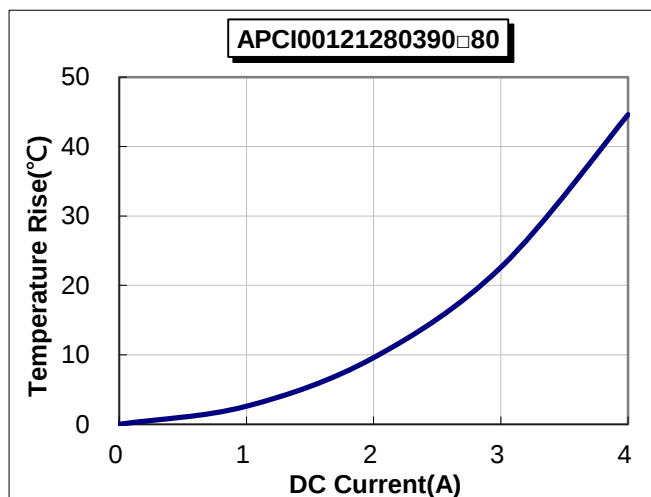
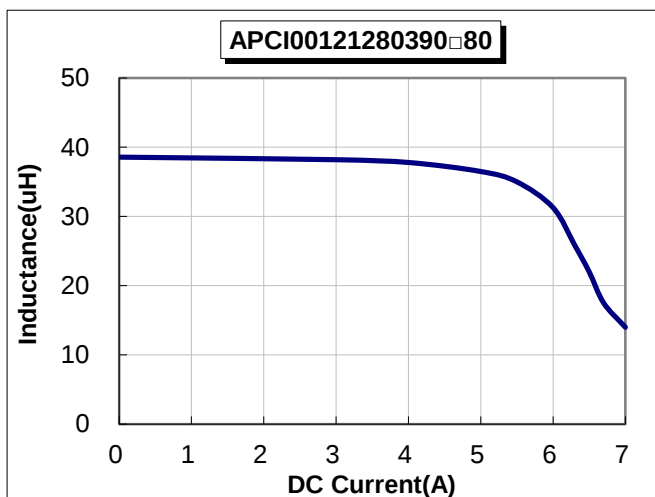
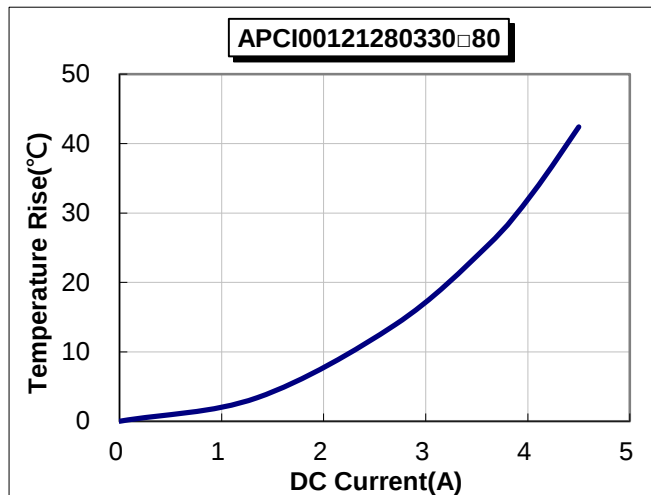
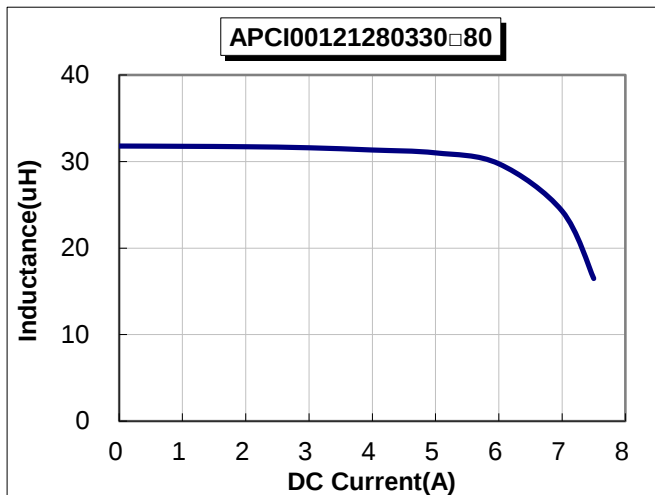
AEC-Q200

TYPICAL ELECTRICAL CHARACTERISTICS

INDUCTANCE vs. DC CURRENT

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@100KHz/0.25V Ambient Temperature : @25°C



APCI00121280 Series Specification

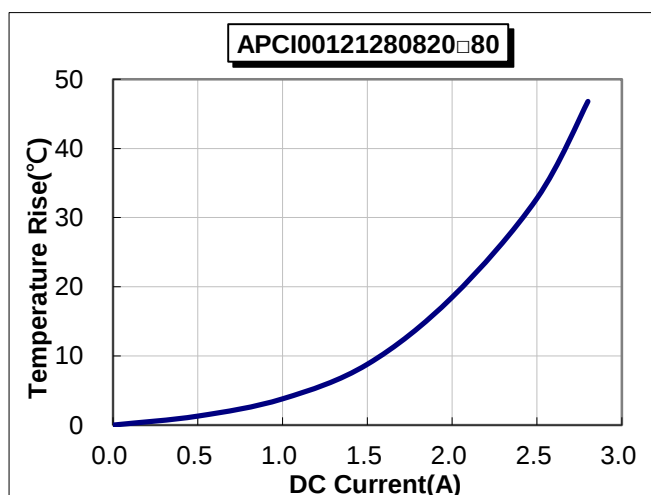
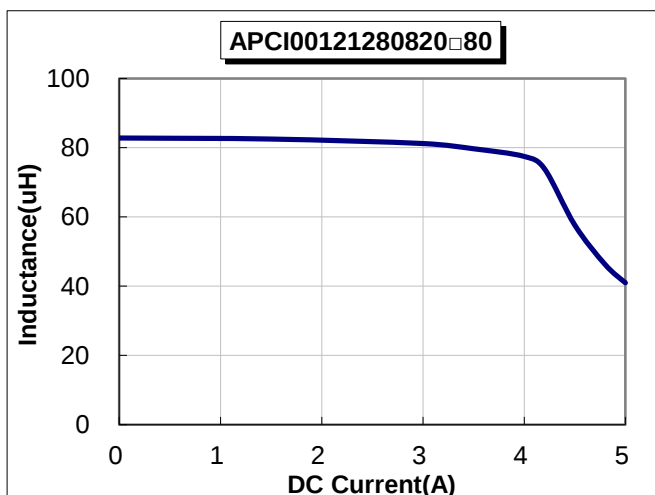
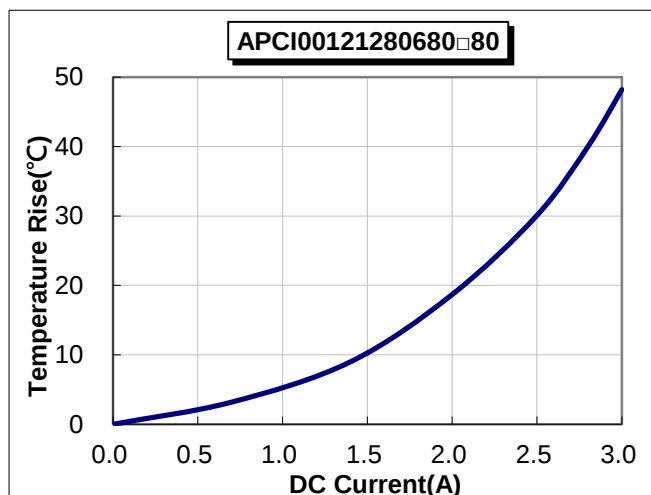
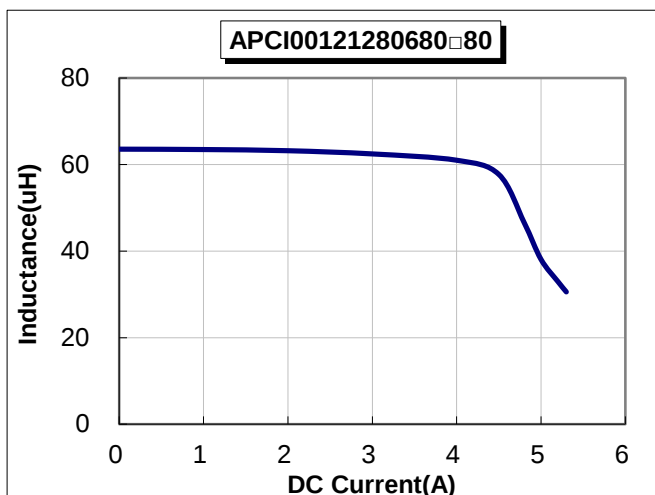
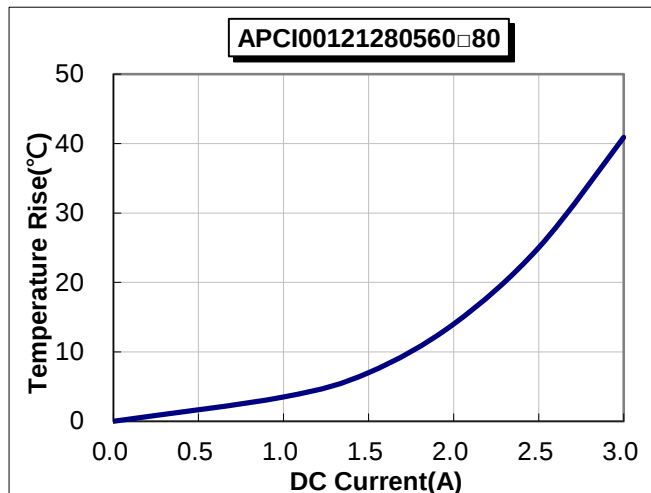
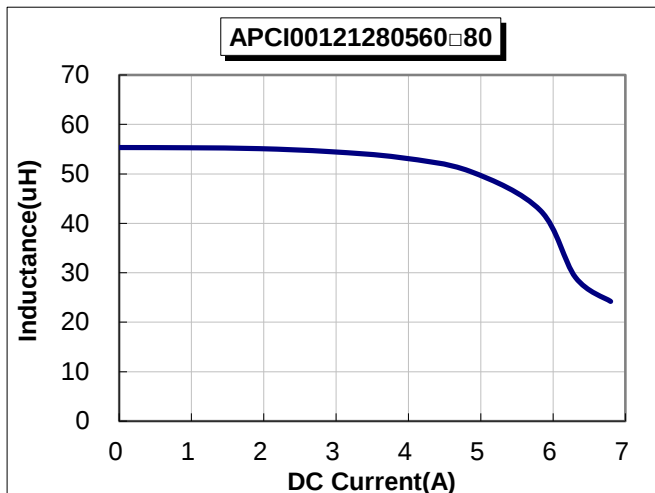
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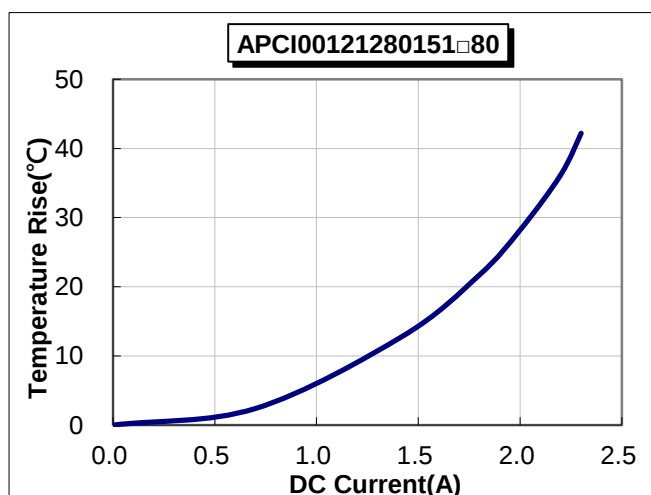
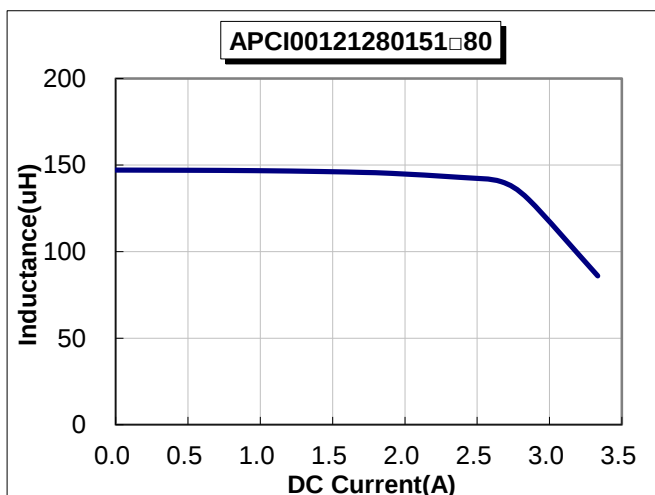
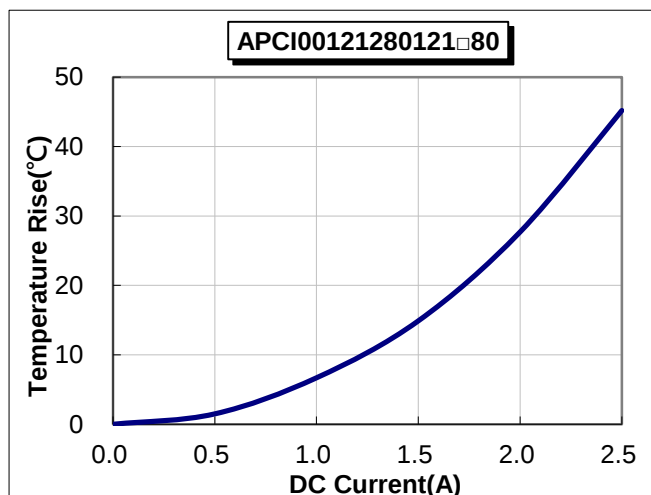
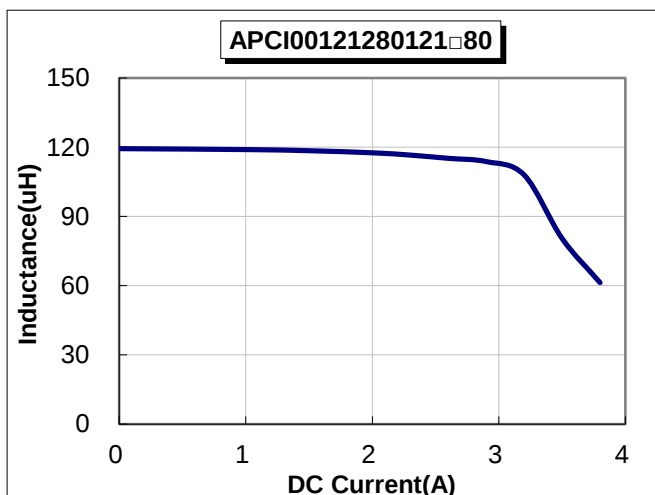
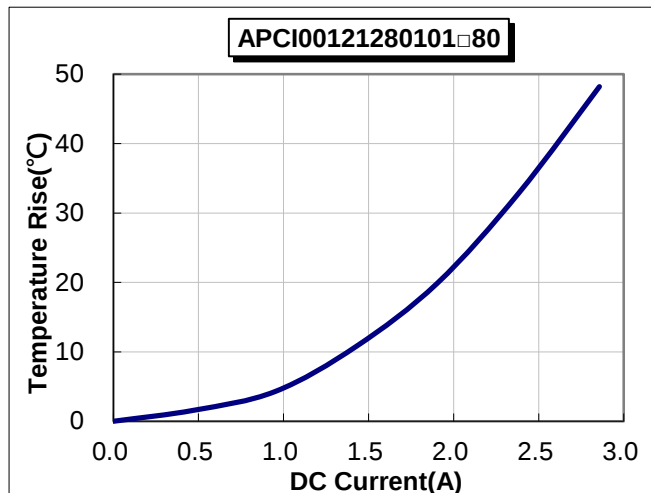
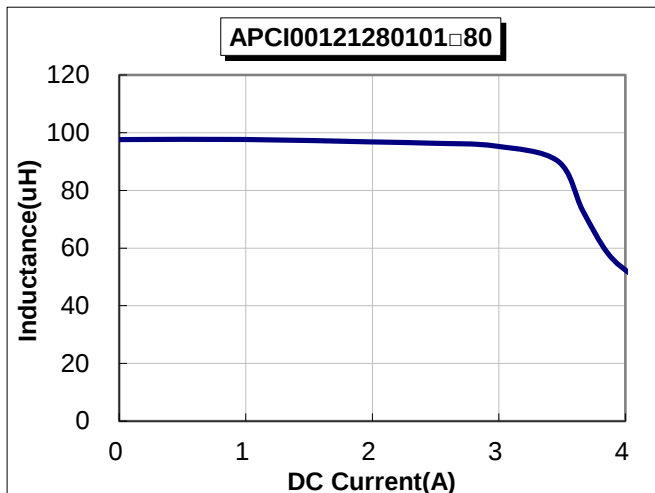
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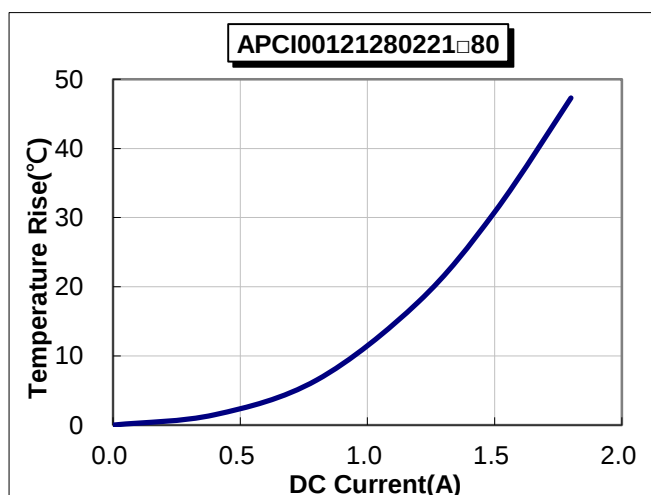
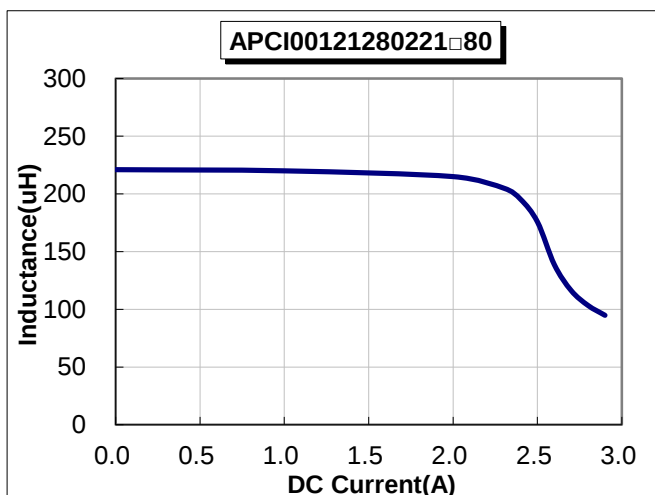
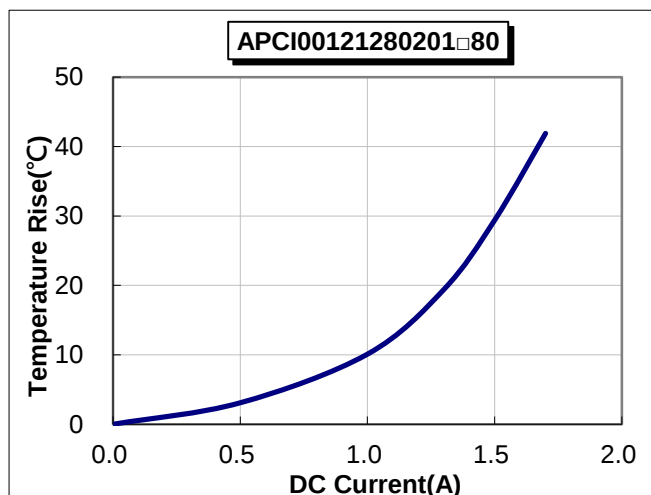
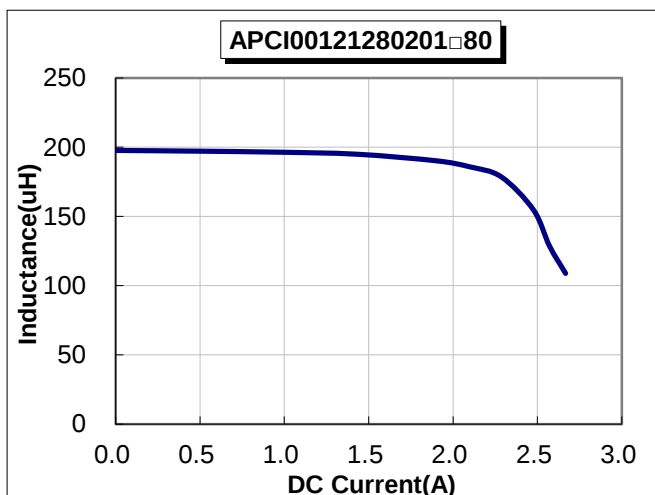
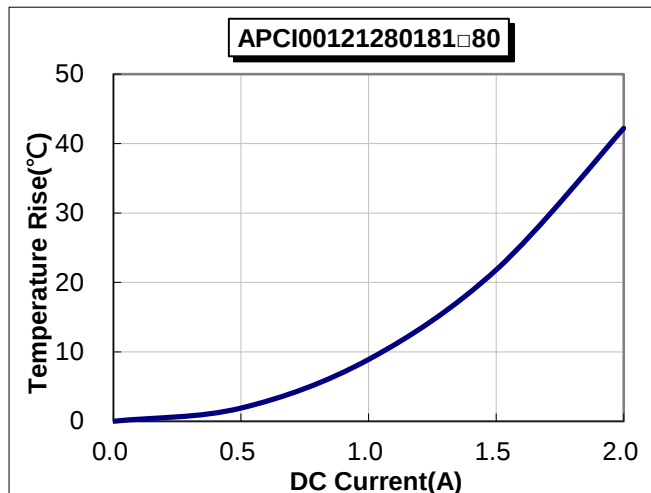
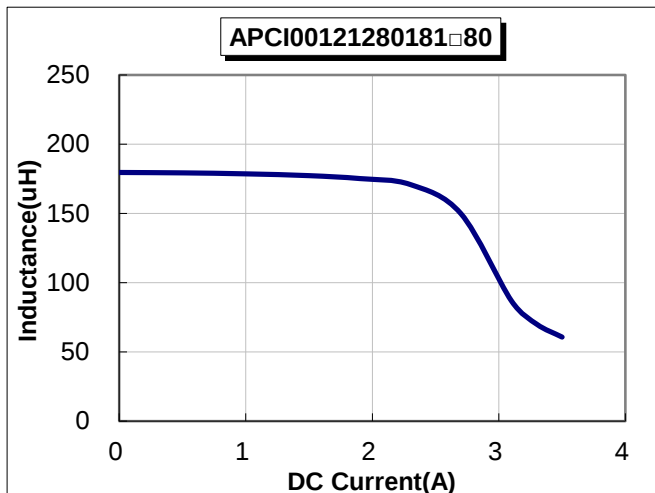
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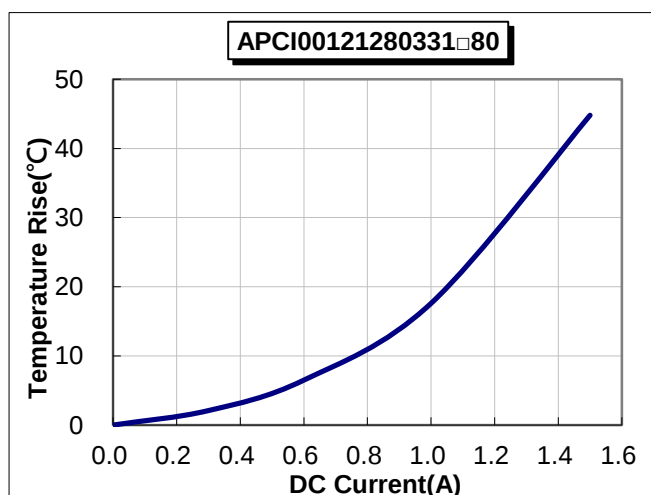
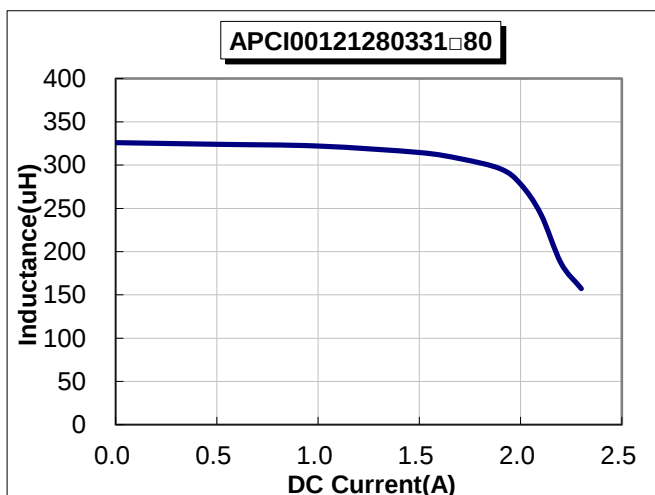
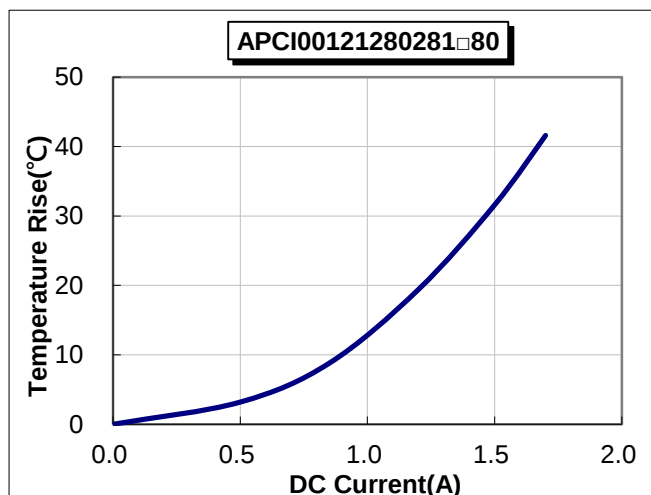
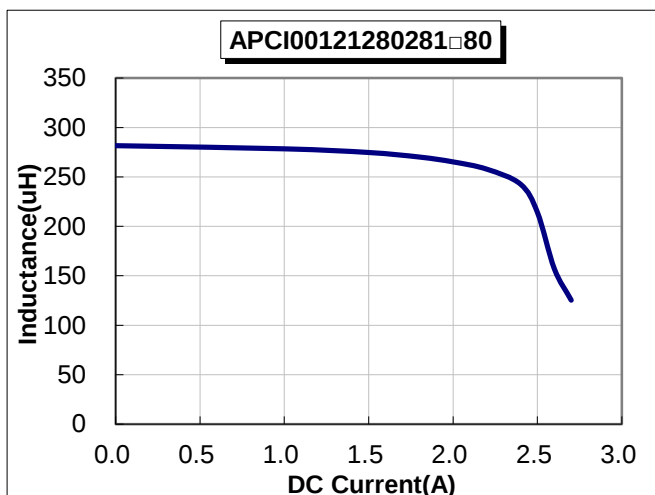
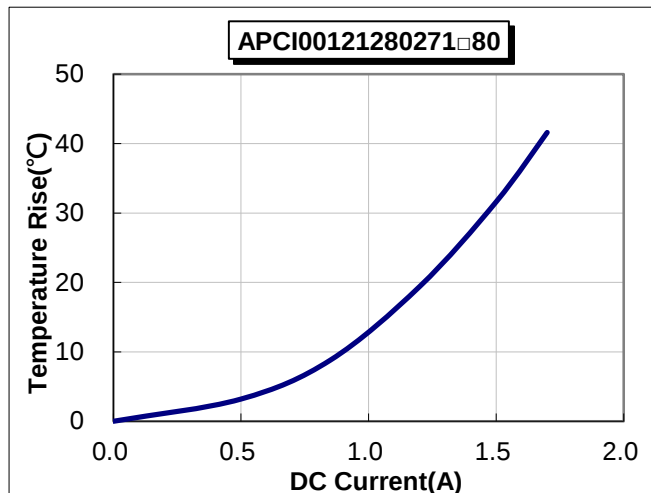
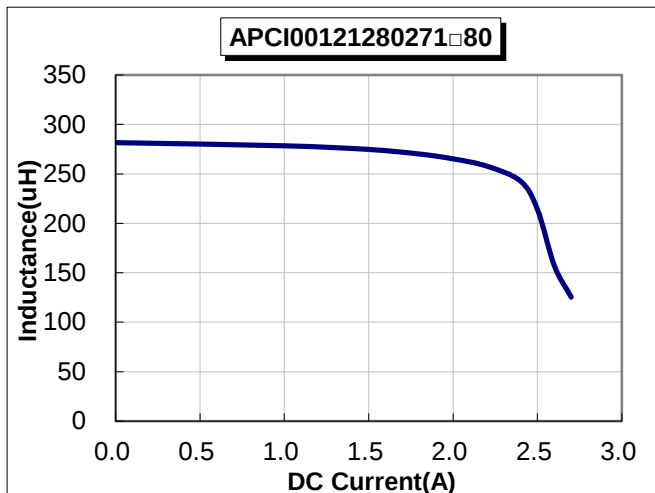
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TYPICAL ELECTRICAL CHARACTERISTICS

INDUCTANCE vs. DC CURRENT

TEMPERATURE vs. DC CURRENT

@100KHz/0.25V Ambient Temperature : @25°C



APCI00121280 Series Specification

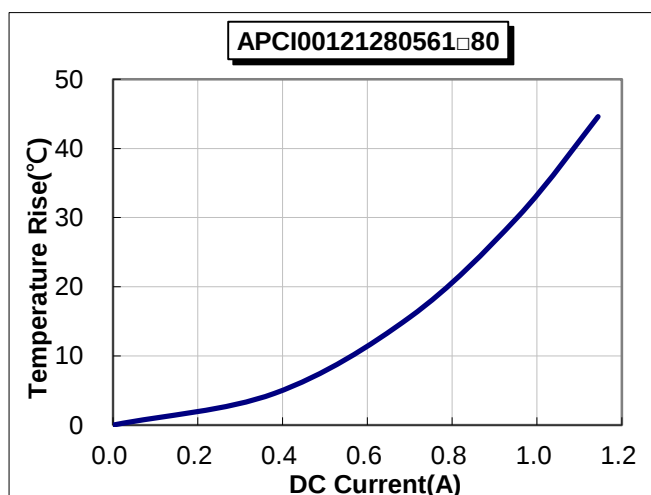
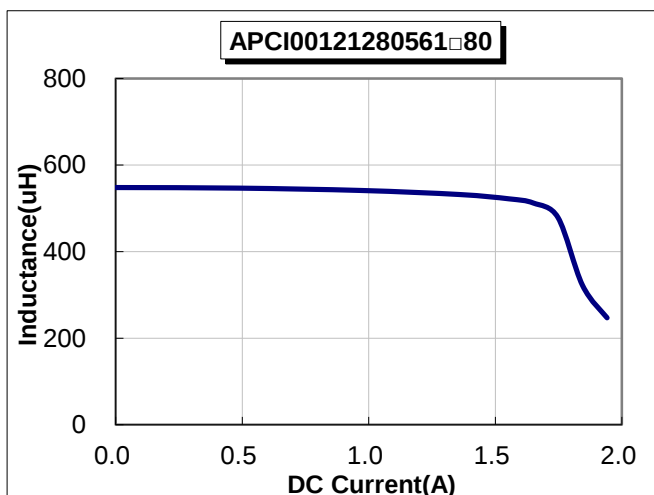
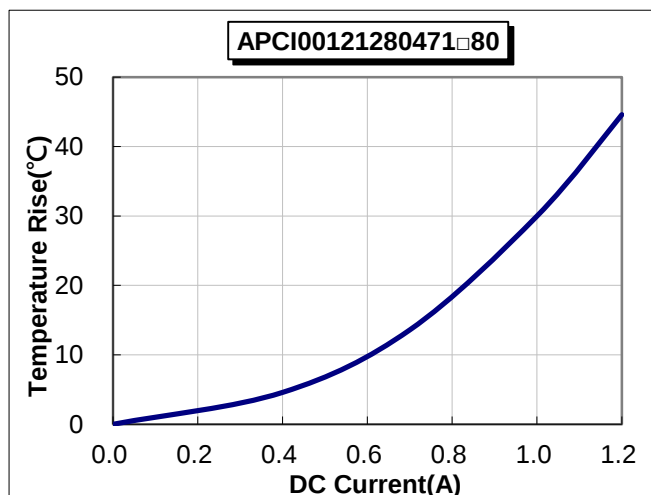
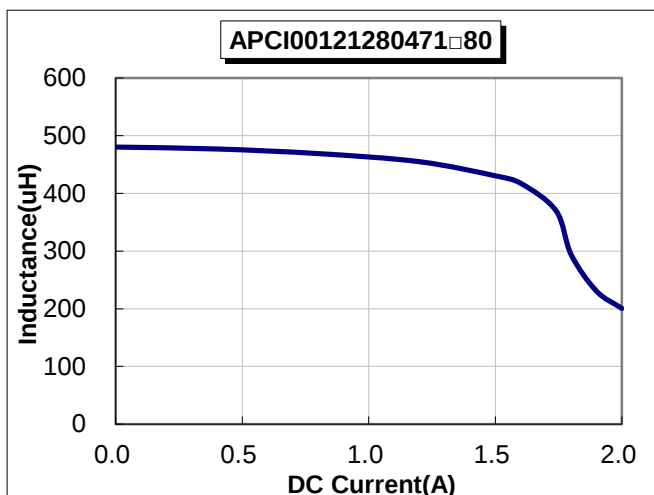
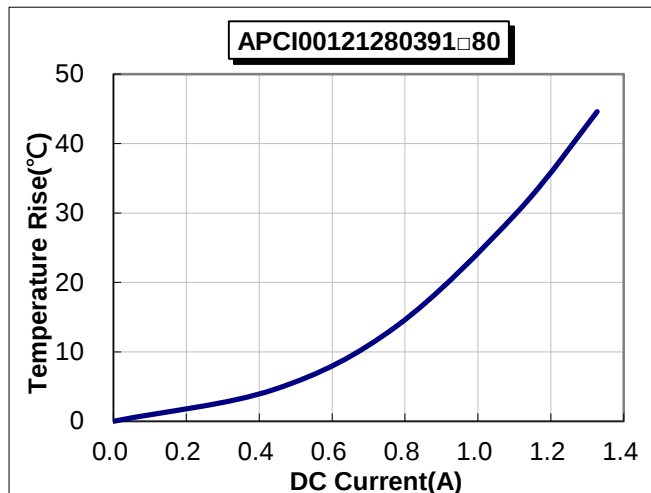
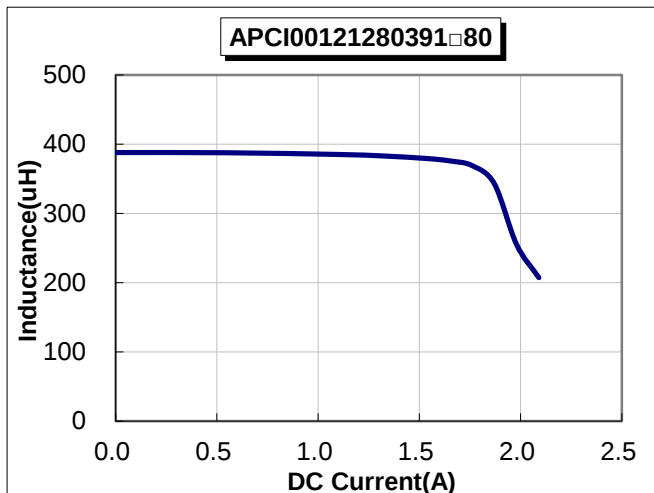
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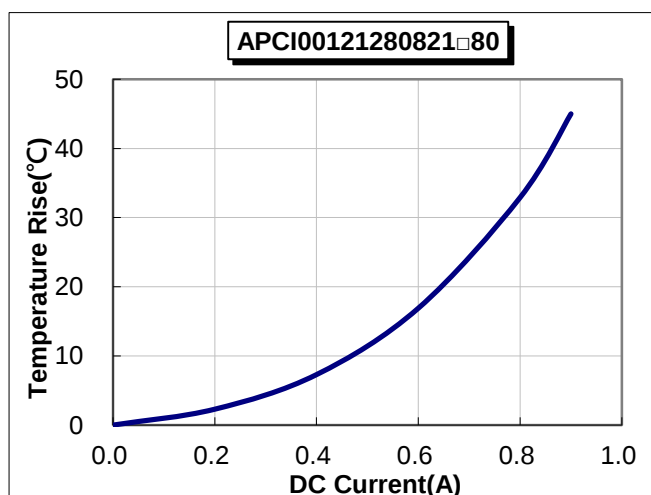
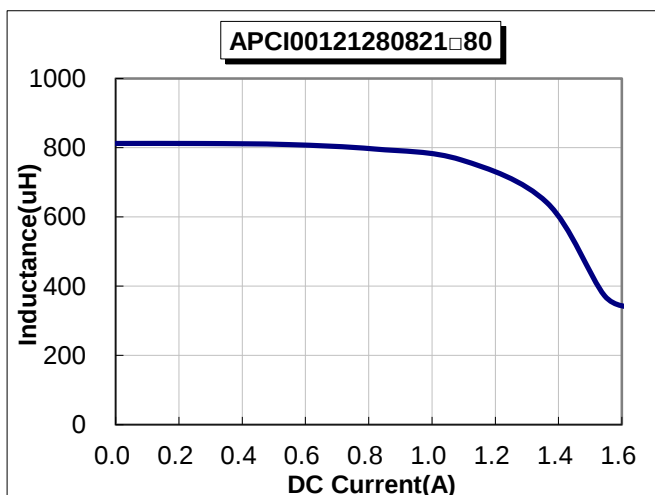
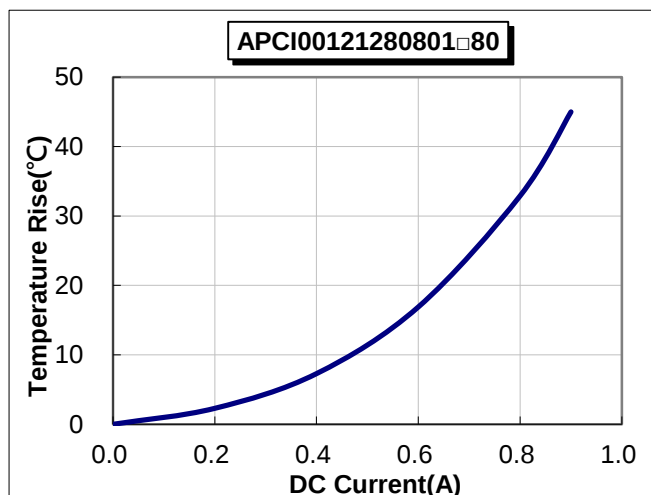
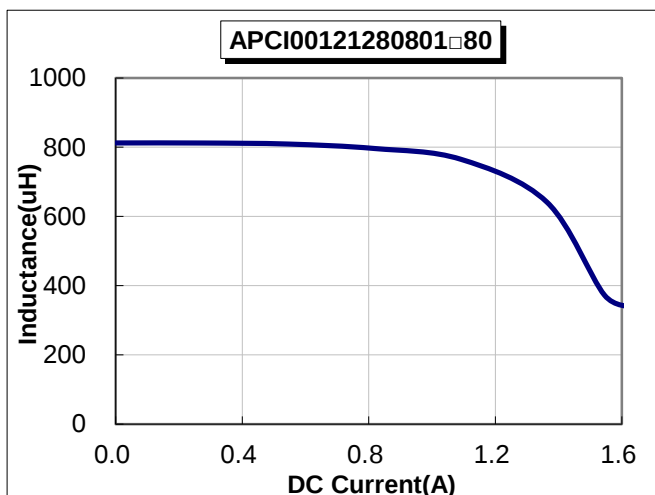
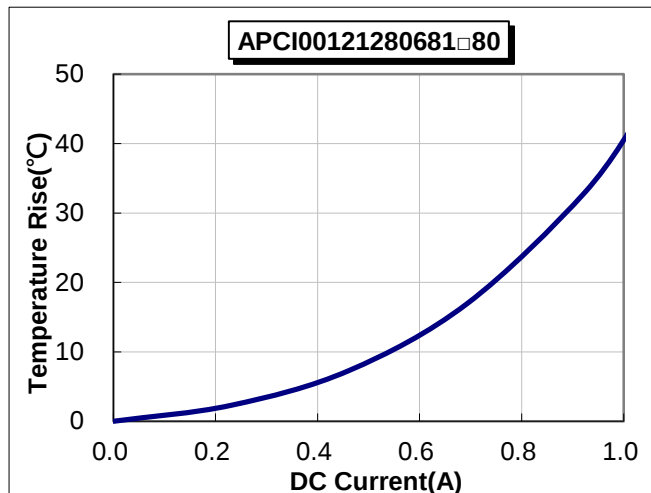
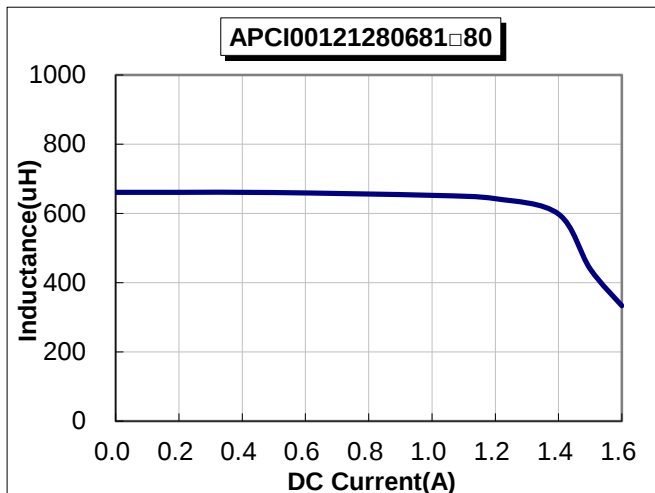
AEC-Q200

TYPICAL ELECTRICAL CHARACTERISTICS

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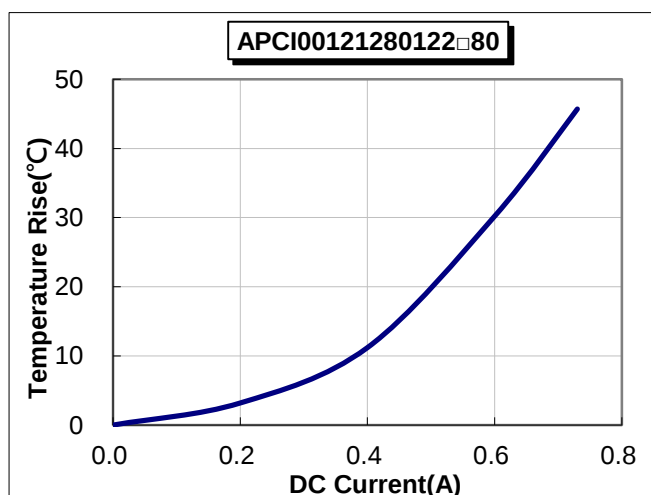
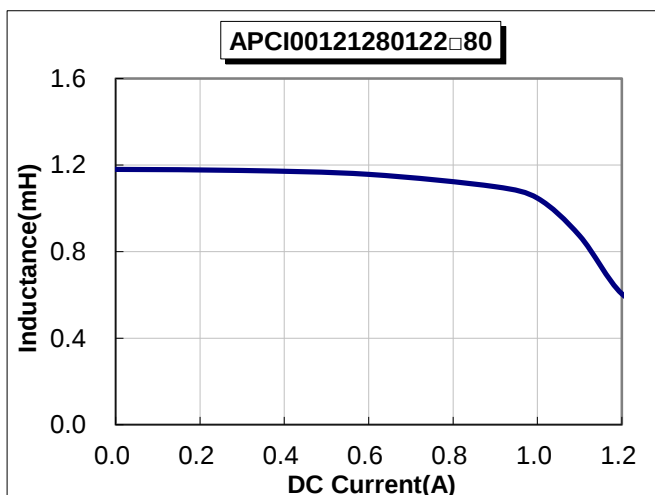
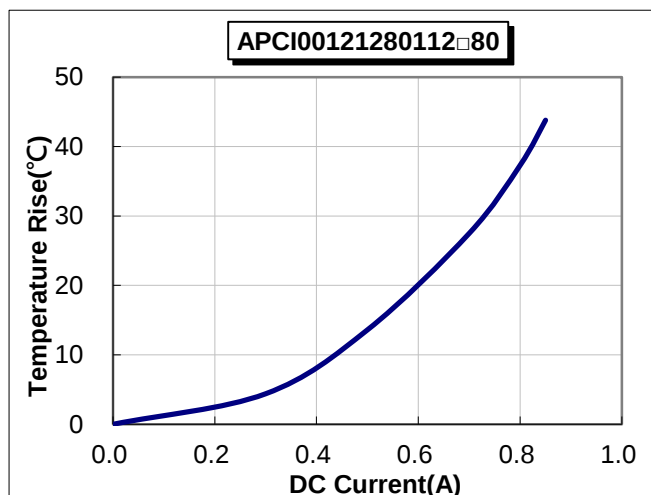
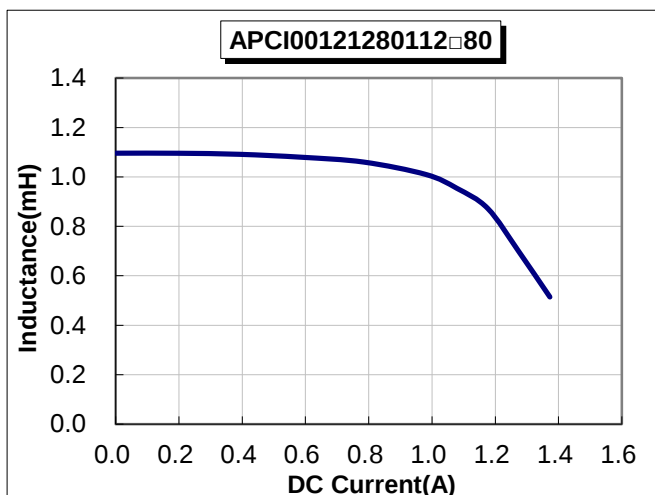
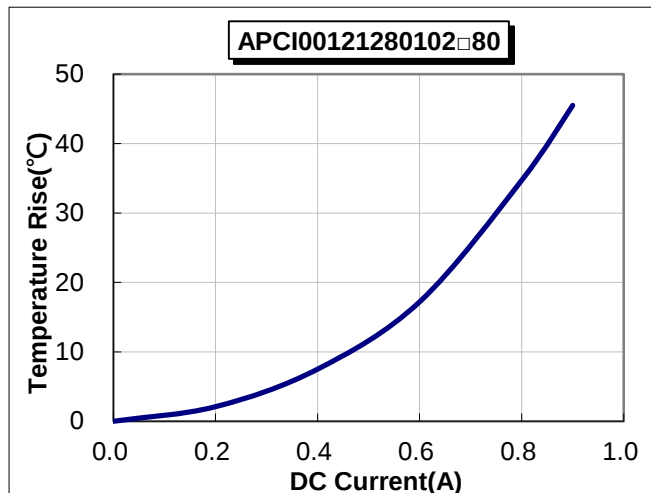
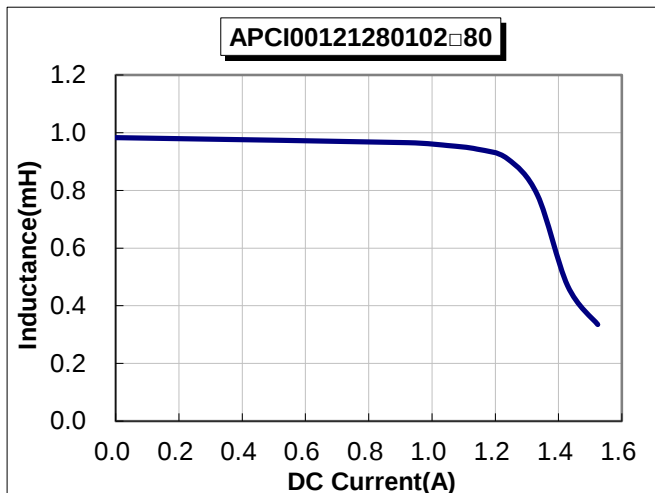
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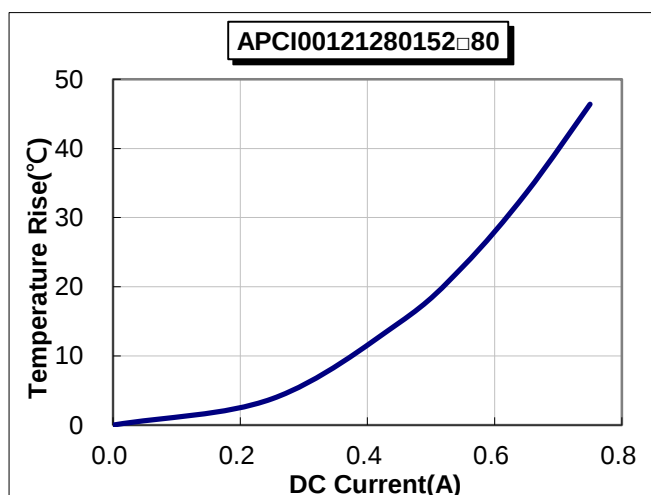
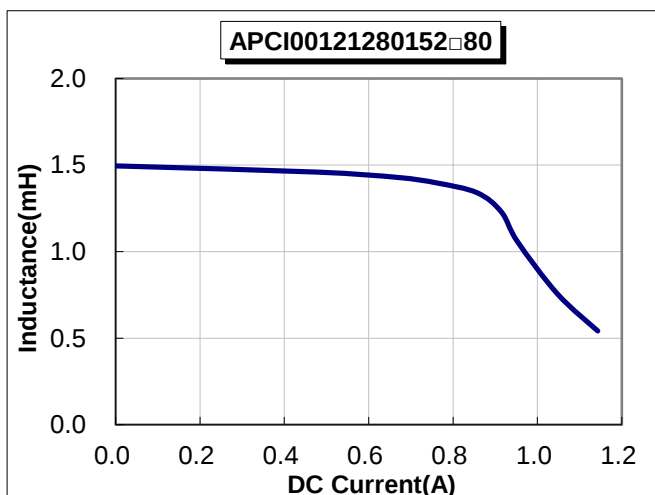
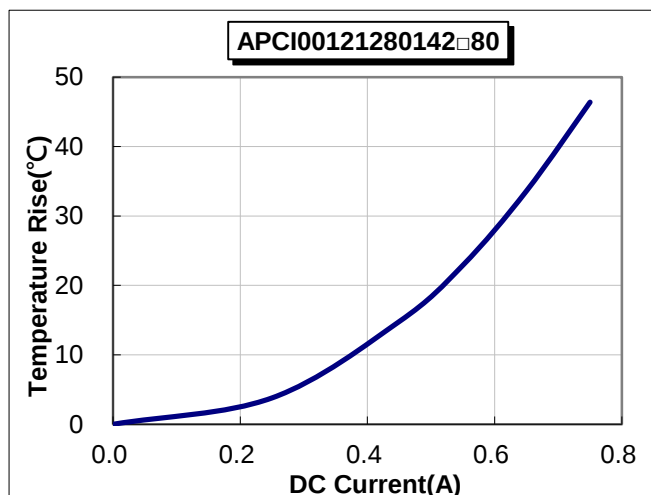
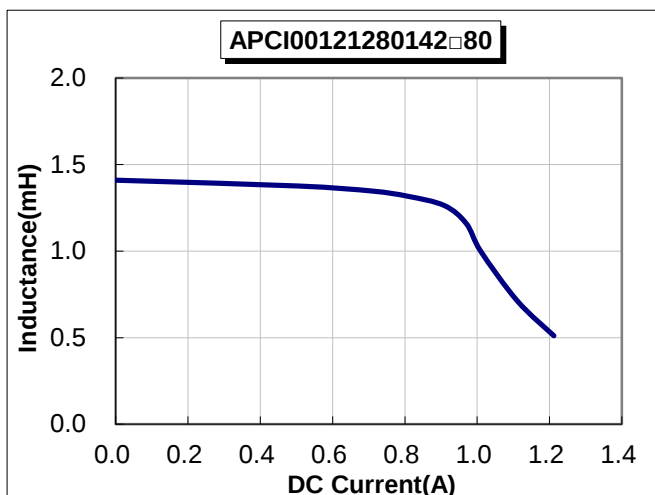
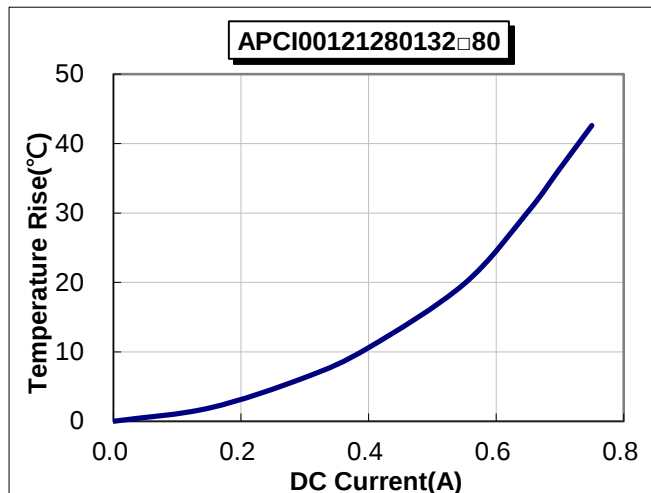
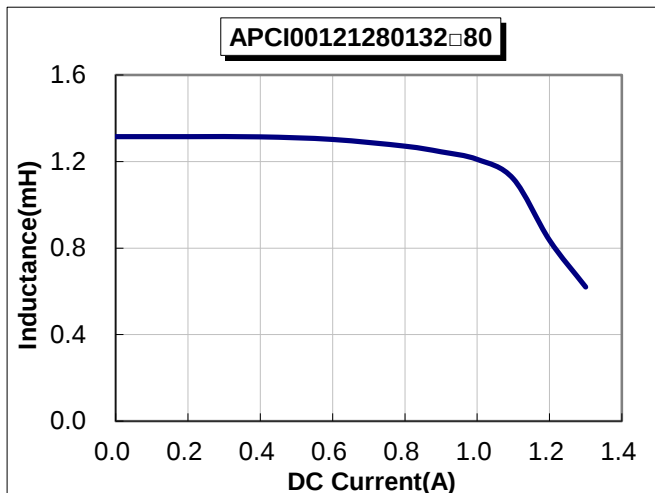
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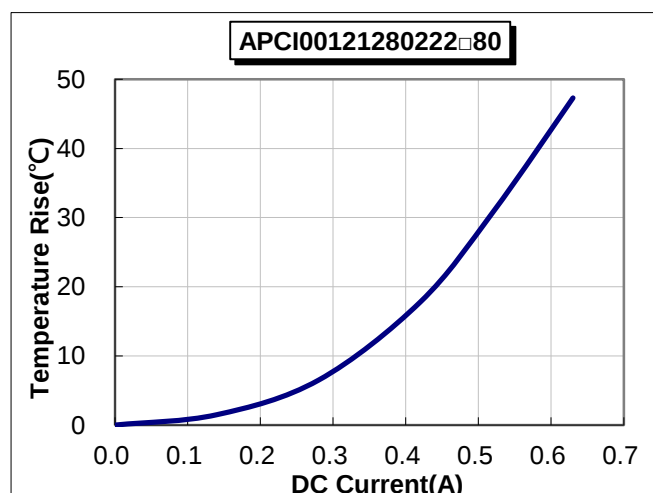
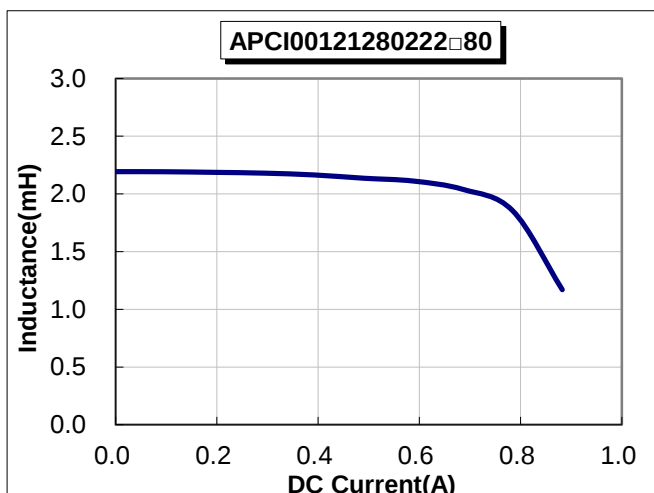
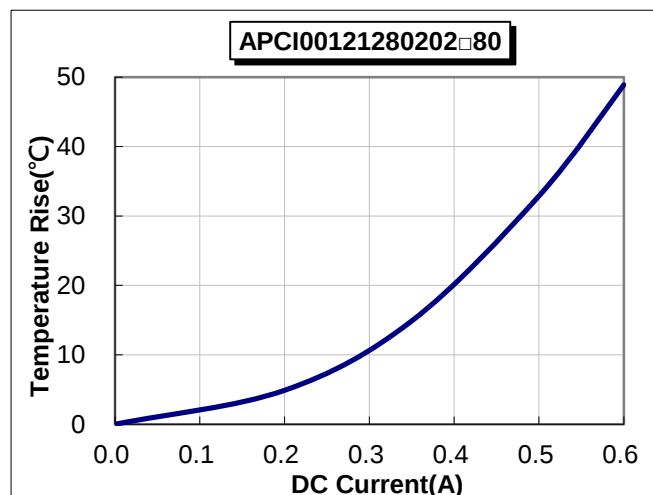
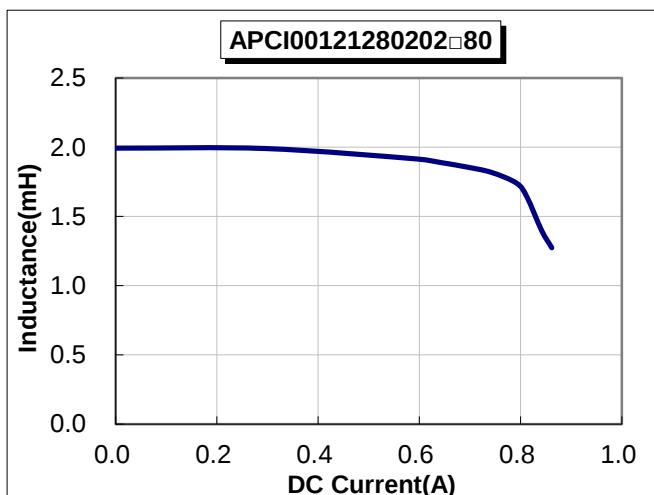
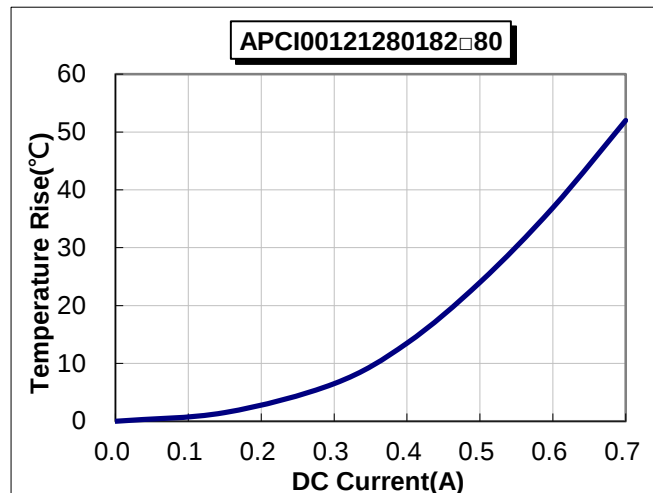
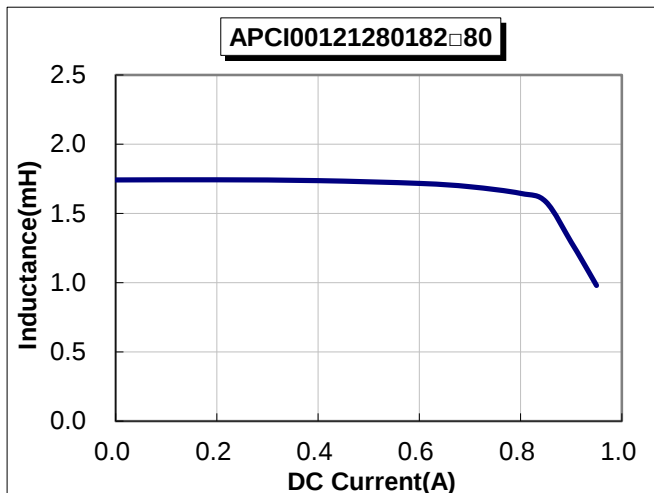
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TYPICAL ELECTRICAL CHARACTERISTICS

INDUCTANCE vs. DC CURRENT

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@10KHz/0.25V Ambient Temperature : @25°C



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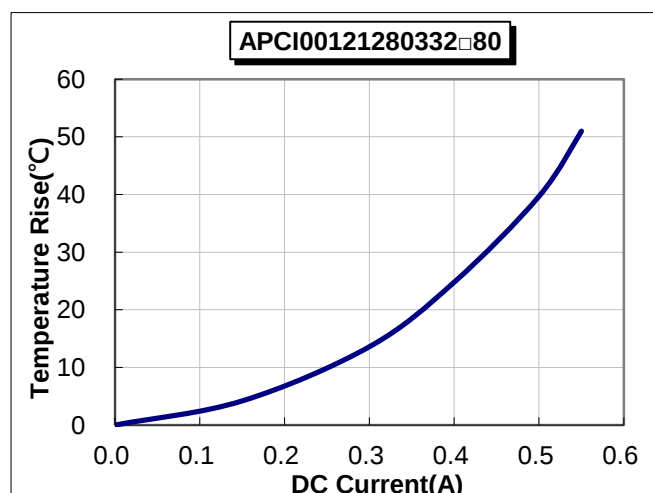
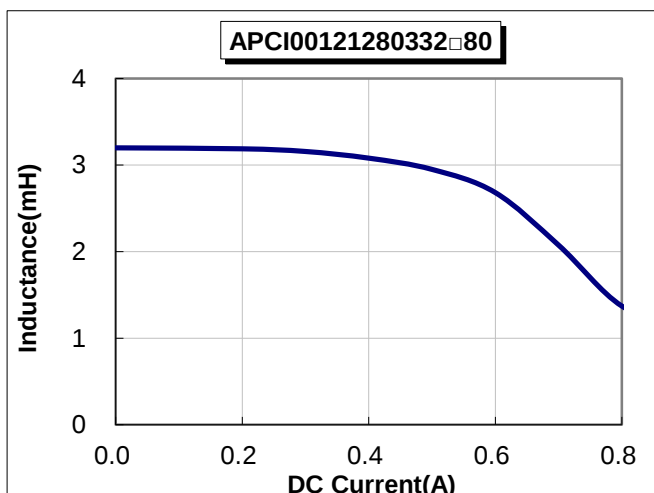
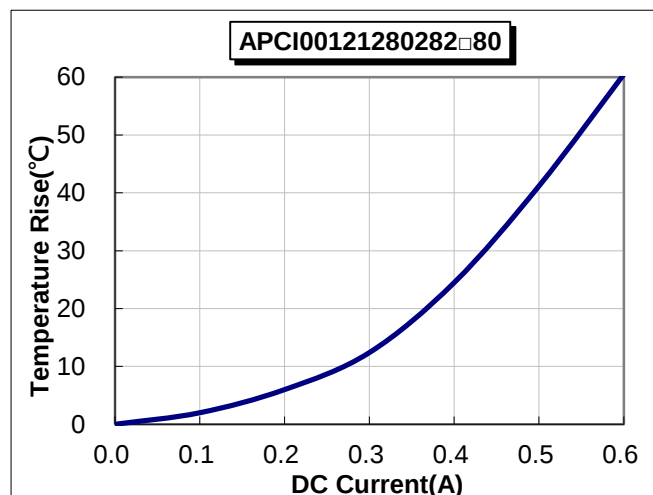
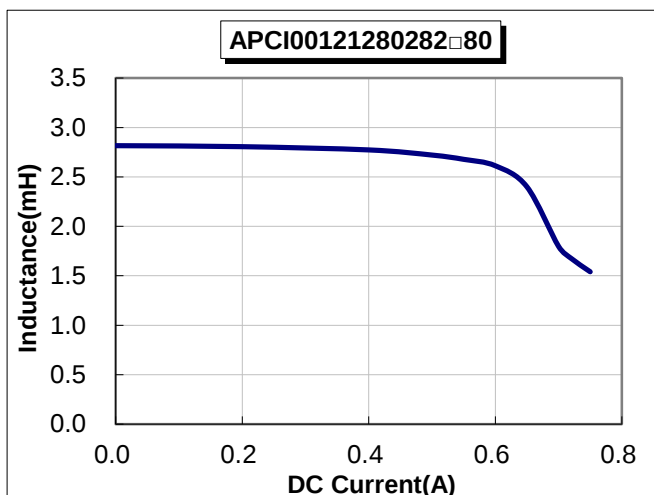
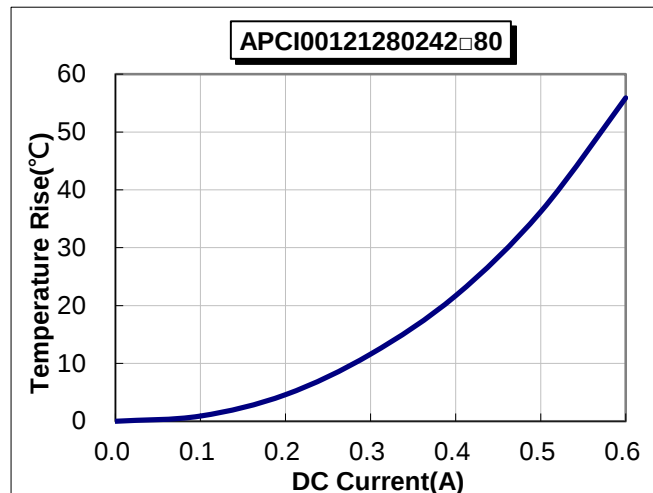
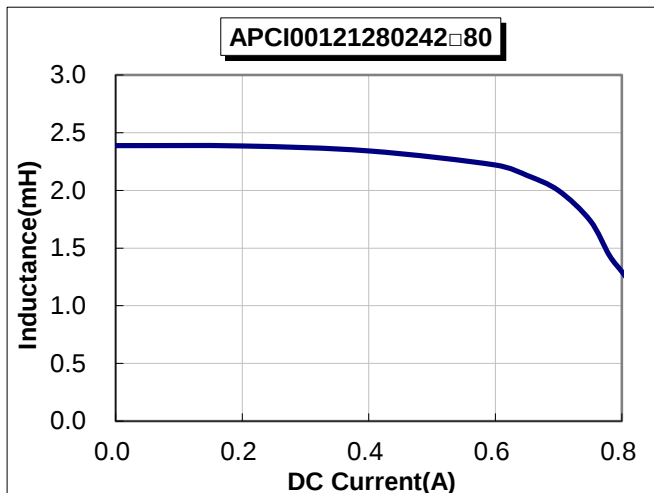
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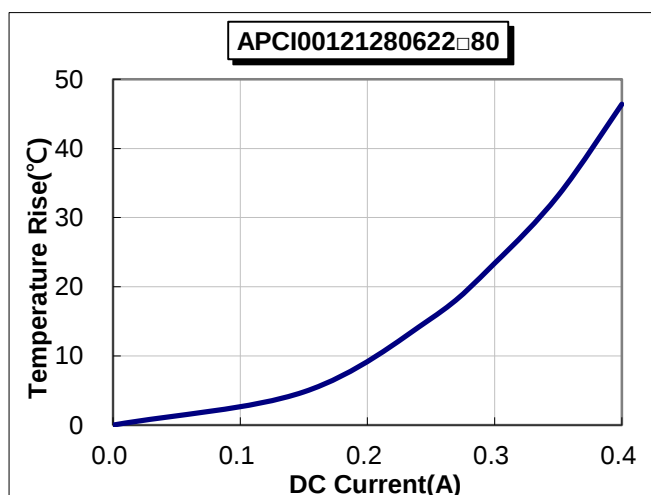
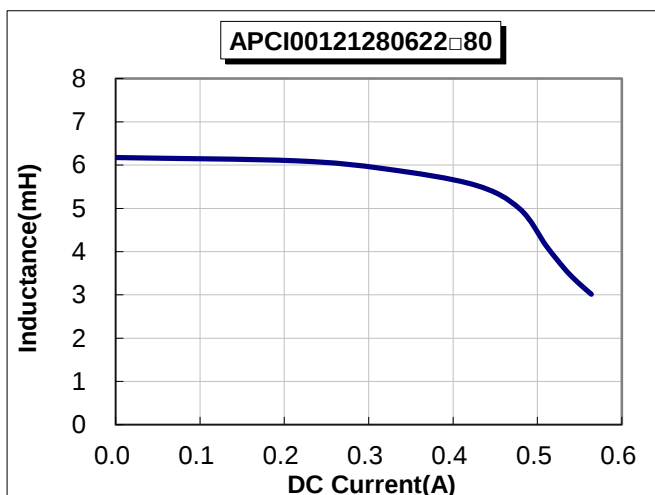
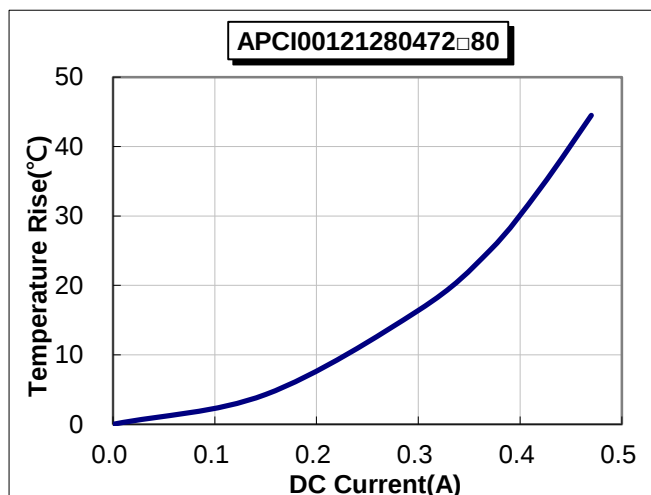
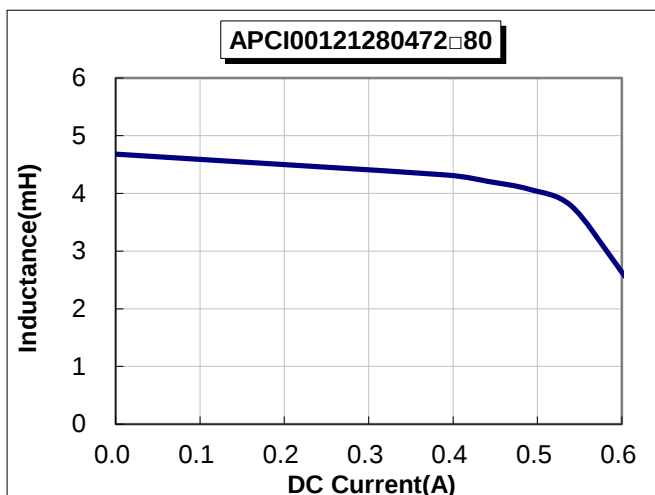
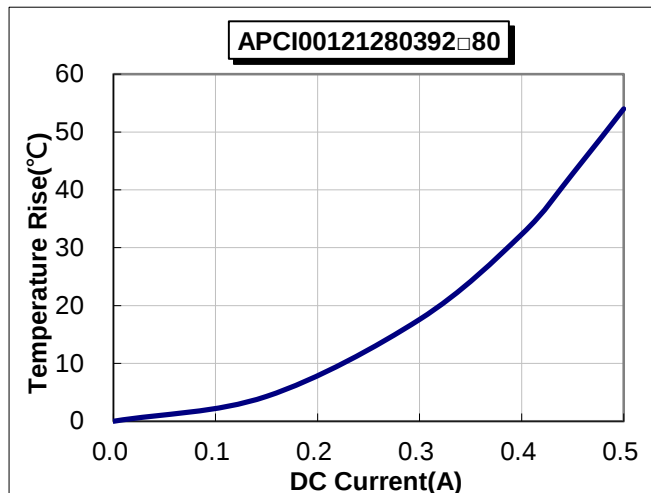
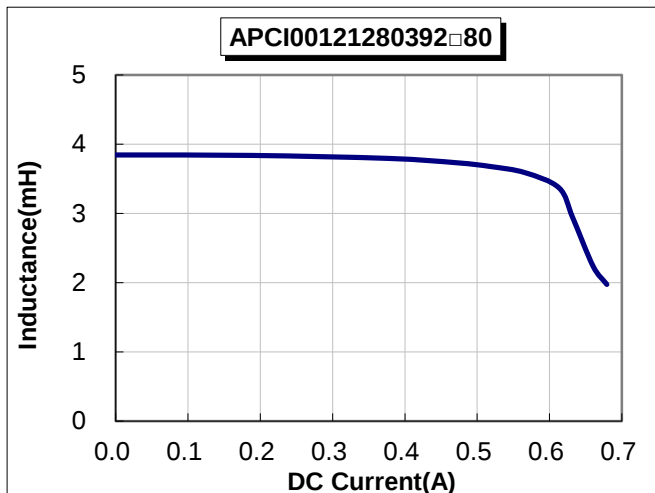
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