

SMD Power Inductor

TMPF(V)-Series(N)-ABD

1. Features

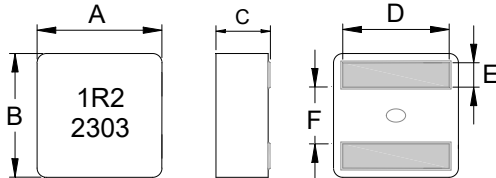
1. Low loss realized with low DCR.
2. High performance realized by metal dust core.
3. Ultra low buzz noise, due to composite construction.
4. 100% Lead(Pb)-Free and RoHS compliant.
5. High reliability -Reliability test complied to AEC-Q200.



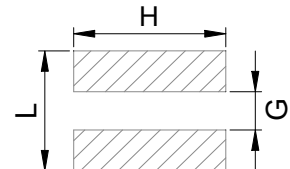
2. Applications

Automotive applications.

3. Dimension



Recommend PC Board Pattern



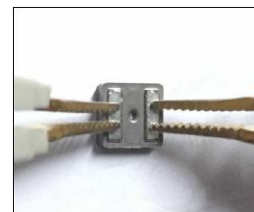
Series	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	L(mm)	G(mm)	H(mm)
TMPF0402AV**-ABD	4.4±0.2	4.4±0.2	1.9±0.2	3.4±0.3	0.88±0.2	1.6±0.25	3.4 ref	1.4 ref	3.8 ref
TMPF0402LRV**-ABD	4.4±0.2	4.4±0.2	1.9±0.2	3.4±0.3	0.88±0.2	1.6±0.25	3.4 ref	1.4 ref	3.8 ref
TMPF0403AV**-ABD	4.4±0.2	4.4±0.2	2.8±0.2	3.4±0.3	0.88±0.2	1.6±0.25	3.4 ref	1.4 ref	3.8 ref
TMPF0403LRV**-ABD	4.4±0.2	4.4±0.2	2.8±0.2	3.4±0.3	0.88±0.2	1.6±0.25	3.4 ref	1.4 ref	3.8 ref
TMPF0502AV**-ABD	6.0±0.2	5.7±0.2	1.9±0.2	4.3±0.3	1.1±0.2	2.3±0.25	4.5 ref	2.0 ref	4.7 ref
TMPF0503AV**-ABD	6.0±0.2	5.7±0.2	2.9±0.2	4.3±0.3	1.1±0.2	2.3±0.25	4.5 ref	2.0 ref	4.7 ref
TMPF0505LRV**-ABD	6.0±0.2	5.7±0.2	4.8±0.2	4.3±0.3	1.1±0.2	2.3±0.25	4.5 ref	2.0 ref	4.7 ref
TMPF0603AV**-ABD	7.2±0.2	6.9±0.2	See Spec	See Spec	1.4±0.2	2.6±0.25	5.6 ref	2.5 ref	5.6 ref
TMPF0604AV**-ABD	7.2±0.2	6.9±0.2	3.8±0.2	See Spec	1.4±0.2	2.6±0.25	5.6 ref	2.5 ref	5.6 ref
TMPF0605AV**-ABD	7.2±0.2	6.9±0.2	4.8±0.2	See Spec	1.4±0.2	2.6±0.25	5.6 ref	2.5 ref	5.6 ref
TMPF0606AV**-ABD	7.2±0.2	6.9±0.2	5.8±0.2	5.3±0.3	1.4±0.2	2.6±0.25	5.6 ref	2.5 ref	5.6 ref
TMPF0606LRV**-ABD	7.2±0.2	6.9±0.2	5.8±0.2	5.3±0.3	1.4±0.2	2.6±0.25	5.6 ref	2.5 ref	5.6 ref
TMPF0702AV**-ABD	8.4±0.3	8.0±0.3	1.85±0.2	See Spec	1.75±0.2	3.15±0.25	7.4 ref	2.8 ref	7.2 ref
TMPF0703AV**-ABD	8.4±0.3	8.0±0.3	2.9±0.2	See Spec	1.75±0.2	3.15±0.25	7.4 ref	2.8 ref	7.2 ref
TMPF0705AV**-ABD	8.4±0.3	8.0±0.3	4.8±0.2	See Spec	1.75±0.2	3.15±0.25	7.4 ref	2.8 ref	7.2 ref
TMPF0707AV**-ABD	8.4±0.3	8.0±0.3	6.7±0.3	See Spec	1.75±0.2	3.15±0.25	7.8 ref	2.8 ref	6.7 ref
TMPF0808AV**-ABD	8.9±0.3	8.5±0.3	7.7±0.3	See Spec	1.8±0.2	3.5±0.3	8.0 ref	2.7 ref	7.8 ref
TMPF1006AV**-ABD	11.9±0.3	11.0±0.3	5.7±0.3	See Spec	2.4±0.2	4.5±0.3	10.5 ref	3.7ref	11.0 ref
TMPF1010AV**-ABD	11.9±0.3	11.0±0.3	9.7±0.3	See Spec	2.4±0.2	4.4±0.3	10.5 ref	3.7ref	11.0 ref
TMPF1031LRV**-ABD	11.9±0.3	11.0±0.30	2.9±0.2	9.0±0.5	2.4±0.2	4.4±0.3	10.5 ref	3.7ref	11.0 ref
TMPF1508AV**-ABD	17.5±0.3	16.5±0.3	7.7±0.3	13.2±0.5	3.2±0.2	7.0±0.3	15.0ref	6.0ref	15.0ref
TMPF1510AV**-ABD	17.5±0.3	16.5±0.3	9.7±0.3	13.2±0.5	3.2±0.2	7.0±0.3	15.0ref	6.0ref	15.0ref
TMPF1513AV**-ABD	17.5±0.3	16.5±0.3	12.7±0.3	13.2±0.5	3.2±0.2	7.0±0.3	15.0ref	6.0ref	15.0ref

4. Part Numbering



A: Series
 B: Dimension
 C: Type
 D: Inductance
 E: Inductance Tolerance
 F: Code

BxC
 Material.
 1R2=1.20uH
 M=±20%
 Marking: Black.1R2 and 2303(23YY,03 WW, follow production date).
 AB:oversize



DCR Test

5. Specification

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A) Typ		I sat (A)		DCR (mΩ) Typ	DCR (mΩ) Max
		20°C rise	40°C rise	Typ	Max		
TMPF0402AV-R10MN-ABD	0.10	13.5	18.0	38.0	33.0	2.2	2.42
TMPF0402AV-R22MN-ABD	0.22	13.0	16.8	19.5	18.8	4.1	4.6
TMPF0402AV-R33MN-ABD	0.33	12.0	15.5	18.0	16.5	5.0	5.5
TMPF0402AV-R36MN-ABD	0.36	11.0	14.5	17.0	15.0	5.6	6.3
TMPF0402AV-R40MN-ABD	0.40	10.0	14.0	15.5	13.5	6.9	7.73
TMPF0402AV-R47MN-ABD	0.47	9.0	12.5	14.5	13.0	7.8	8.58
TMPF0402AV-R56MN-ABD	0.56	8.5	12.0	14.0	12.6	8.4	9.3
TMPF0402AV-R60MN-ABD	0.60	8.0	11.7	13.7	12.3	8.6	9.52
TMPF0402AV-R72MN-ABD	0.72	7.6	10.5	12.0	10.6	10.4	11.6
TMPF0402AV-1R0MN-ABD	1.00	6.8	9.6	9.6	8.8	13.3	14.6
TMPF0402AV-1R2MN-ABD	1.20	6.6	9.0	9.0	7.8	16.2	17.9
TMPF0402AV-1R5MN-ABD	1.50	5.8	7.6	8.0	7.4	21.0	23.5
TMPF0402AV-1R8MN-ABD	1.80	5.2	7.0	7.5	7.0	25.0	28.0

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 155°C under worst case operating conditions.Circuit design,component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. I rms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 15V ref (1.5uH and above) .
 Rated operating voltage(across inductor) 40V ref (1.2uH and below).

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A) Typ		I sat (A)				DCR (mΩ) Typ.	DCR (mΩ) Max.
		20°C rise	40°C rise	Typ			Max		
				1	2	3			
TMPF0402LRV-R47MN-ABD	0.47	9.8	13.2	7.0	10.0	14.0	12.5	6.0	6.8
TMPF0402LRV-R56MN-ABD	0.56	9.5	12.6	6.0	9.0	13.0	11.3	6.9	7.8
TMPF0402LRV-R60MN-ABD	0.60	9.4	12.4	5.8	8.8	12.8	11.1	6.9	7.8
TMPF0402LRV-R68MN-ABD	0.68	9.2	12.0	5.2	8.0	11.6	10.0	7.3	8.2
TMPF0402LRV-R82MN-ABD	0.82	8.5	11.5	4.8	6.5	10.2	9.0	8.6	9.5
TMPF0402LRV-1R0MN-ABD	1.00	8.0	11.0	4.5	5.4	9.2	8.0	10.6	11.7
TMPF0402LRV-1R2MN-ABD	1.20	7.2	9.5	4.3	5.0	8.6	7.5	12.2	13.4
TMPF0402LRV-1R5MN-ABD	1.50	6.7	9.1	4.1	4.5	7.5	6.7	14.4	15.8
TMPF0402LRV-2R0MN-ABD	2.00	6.2	8.2	3.2	4.0	6.2	5.0	21.15	23.3
TMPF0402LRV-2R2MN-ABD	2.20	6.0	8.0	3.1	3.8	6.0	4.8	21.35	23.5

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
5. Saturation Current (Isat 1) will cause L0 to drop approximately 10%.
Saturation Current (Isat 2) will cause L0 to drop approximately 20%.
Saturation Current (Isat 3) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 155°C under worst case operating conditions. Circuit design, component, PCB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. Irms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor)15V Ref.

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A) Typ		I sat (A)		DCR (mΩ) Typ.	DCR (mΩ) Max.
		20°C rise	40°C rise	Typ	Max		
TMPF0403AV-R47MN-ABD	0.47	10.0	14.0	17.0	15.0	6.6	7.26
TMPF0403AV-1R0MN-ABD	1.00	7.0	10.0	10.0	9.0	11.6	12.76
TMPF0403AV-2R2MN-ABD	2.20	5.5	7.2	7.0	6.2	18.9	20.8

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 155°C under worst case operating conditions. Circuit design, component, PCB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. Rated operating voltage(across inductor) 40V ref.

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A) Typ		I sat (A)				DCR (mΩ) Typ.	DCR (mΩ) Max.
		20°C rise	40°C rise	Typ			Max		
				1	2	3			
TMPF0403LRV-R90MN-ABD	0.90	8.2	11.2	5.2	7.0	10.0	9.2	9.1	10.1
TMPF0403LRV-1R0MN-ABD	1.00	8.0	11.0	5.0	6.8	9.8	9.0	9.1	10.1
TMPF0403LRV-1R2MN-ABD	1.20	7.8	9.8	4.6	6.4	9.2	8.7	10.4	11.5
TMPF0403LRV-1R5MN-ABD	1.50	7.0	9.0	4.1	5.6	8.0	7.0	12.0	13.2
TMPF0403LRV-1R8MN-ABD	1.80	6.5	8.2	3.8	5.3	7.5	6.6	17.4	19.2
TMPF0403LRV-2R2MN-ABD	2.20	6.0	7.8	3.6	5.1	7.0	6.1	20.5	22.6
TMPF0403LRV-3R3MN-ABD	3.30	5.0	6.6	3.3	4.8	6.2	5.3	26.0	28.6

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
5. Saturation Current (Isat 1) will cause L0 to drop approximately 10%.
Saturation Current (Isat 2) will cause L0 to drop approximately 20%.
Saturation Current (Isat 3) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 125°C under worst case operating conditions. Circuit design, component, PCB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. Irms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 15Vref.

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A) Typ		I sat (A)		DCR (mΩ) Typ.	DCR (mΩ) Max.
		20°C rise	40°C rise	Typ	Max		
TMPF0502AV-R15MN-ABD	0.15	13.9	18.8	30.0	27.0	4.00	4.60
TMPF0502AV-R16MN-ABD	0.16	13.9	18.8	30.0	27.0	4.00	4.60
TMPF0502AV-R33MN-ABD	0.33	10.5	14.4	26.0	24.0	6.10	7.00
TMPF0502AV-R47MN-ABD	0.47	10.1	14.1	22.0	20.0	7.00	8.05
TMPF0502AV-R56MN-ABD	0.56	9.9	13.9	19.0	16.0	8.70	9.54
TMPF0502AV-R68MN-ABD	0.68	9.6	13.4	16.0	14.0	8.90	10.2
TMPF0502AV-R80MN-ABD	0.80	9.4	13.0	15.5	13.5	10.3	11.8
TMPF0502AV-R82MN-ABD	0.82	8.5	12.0	15.0	13.0	11.0	12.7
TMPF0502AV-1R0MN-ABD	1.00	7.5	10.5	14.5	12.8	12.0	13.8
TMPF0502AV-1R2MN-ABD	1.20	6.8	9.40	14.0	12.2	14.2	16.3
TMPF0502AV-1R5MN-ABD	1.50	6.4	8.80	13.3	11.7	16.2	18.7

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 125°C under worst case operating conditions.Circuit design,component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. Irms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 40Vref.

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A) Typ		I sat (A)		DCR (mΩ) Typ.	DCR (mΩ) Max.
		20°C rise	40°C rise	Typ	Max		
TMPF0503AV-R15MN-ABD	0.15	14.3	22.2	36.0	32.5	2.10	2.31
TMPF0503AV-R16MN-ABD	0.16	14.2	22.2	35.0	32.0	2.12	2.33
TMPF0503AV-R28MN-ABD	0.28	14.0	19.0	32.0	28.0	3.00	3.30
TMPF0503AV-R33MN-ABD	0.33	13.8	19.2	28.0	26.0	3.20	3.52
TMPF0503AV-R47MN-ABD	0.47	13.7	18.4	26.0	24.0	3.75	4.13
TMPF0503AV-R56MN-ABD	0.56	13.6	17.7	22.2	20.2	4.05	4.52
TMPF0503AV-R60MN-ABD	0.60	13.6	17.7	22.0	20.0	4.11	4.52
TMPF0503AV-R80MN-ABD	0.80	10.1	13.1	20.0	18.0	5.14	5.65
TMPF0503AV-R82MN-ABD	0.82	9.90	12.9	19.7	17.6	5.25	5.78
TMPF0503AV-1R0MN-ABD	1.00	9.00	12.2	16.5	14.3	6.90	7.60
TMPF0503AV-1R2MN-ABD	1.20	8.50	11.0	15.0	13.5	8.80	9.70
TMPF0503AV-1R5MN-ABD	1.50	8.00	10.5	14.0	12.5	10.1	11.2
TMPF0503AV-1R8MN-ABD	1.80	7.60	10.1	12.3	11.3	11.5	12.7
TMPF0503AV-2R2MN-ABD	2.20	7.20	9.70	10.0	9.0	13.2	14.5
TMPF0503AV-3R3MN-ABD	3.30	5.90	8.10	9.5	8.7	21.0	23.1
TMPF0503AV-3R6MN-ABD	3.60	4.60	6.50	9.0	7.9	25.0	27.5
TMPF0503AV-4R7MN-ABD	4.70	4.30	5.90	8.2	7.0	33.0	36.3

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L/Q: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 155°C under worst case operating conditions.Circuit design,component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. Irms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 40V ref.

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A) Typ		I sat (A)		DCR(mΩ) Typ.	DCR(mΩ) Max.
		20°C rise	40°C rise	Typ	Max		
TMPF0505LRV-4R7MN-ABD	4.70	5.90	8.10	8.80	7.40	19.0	21.0
TMPF0505LRV-5R6MN-ABD	5.60	5.30	7.20	8.60	7.20	22.0	24.2
TMPF0505LRV-6R8MN-ABD	6.80	4.80	6.40	7.80	6.60	26.0	28.6
TMPF0505LRV-8R2MN-ABD	8.20	4.60	6.10	7.20	6.10	29.5	32.5

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L/Q: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
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7. Special inquiries besides the above common used types can be met on your requirement.
8. I rms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 15V ref.

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A) Typ		I sat (A)		DCR (mΩ) Typ.	DCR (mΩ) Max.	C(mm) ±0.2	D(mm) ±0.3
		20°C rise	40°C rise	Typ	Max				
TMPF0603AV-R18MN-ABD	0.18	24.0	32.0	40.0	36.0	1.60	1.75	2.8	5.30
TMPF0603AV-R33MN-ABD	0.33	20.0	25.0	32.0	28.0	2.25	2.50	2.8	5.55
TMPF0603AV-R56MN-ABD	0.56	17.0	22.0	29.0	25.0	3.00	3.31	2.8	5.30
TMPF0603AV-R68MN-ABD	0.68	15.0	20.0	25.0	21.0	4.7	5.17	2.8	5.30
TMPF0603AV-1R0MN-ABD	1.00	13.0	18.0	23.0	18.0	5.50	6.05	2.8	5.20
TMPF0603AV-1R2MN-ABD	1.20	12.0	16.0	22.0	16.0	6.70	7.40	2.8	5.15
TMPF0603AV-1R5MN-ABD	1.50	11.0	15.0	20.0	15.5	8.30	9.13	2.9	5.15
TMPF0603AV-1R8MN-ABD	1.80	10.0	14.0	18.2	13.0	9.20	10.2	2.9	5.10
TMPF0603AV-2R2MN-ABD	2.20	7.00	10.0	15.9	11.0	11.0	12.2	2.9	5.05
TMPF0603AV-3R3MN-ABD	3.30	6.00	8.00	12.2	9.00	18.8	20.8	2.9	5.00
TMPF0603AV-4R5MN-ABD	4.50	5.00	7.00	10.0	8.00	23.0	25.3	2.9	5.00
TMPF0603AV-4R7MN-ABD	4.70	4.0	6.0	9.0	7.0	26.5	29.2	2.9	5.00

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L/Q: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 155°C under worst case operating conditions. Circuit design, component, PCB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. I rms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 40V ref.

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A) Typ		I sat (A)		DCR (mΩ) Typ.	DCR (mΩ) Max.	D (mm) ±0.3
		20°C rise	40°C rise	Typ	Max			
TMPF0604AV-R47MN-ABD	0.47	19	24	31	27	2.6	2.86	5.5
TMPF0604AV-R68MN-ABD	0.68	16	20.5	26	22	3.6	3.96	5.5
TMPF0604AV-1R0MN-ABD	1.0	14	19	23	18	4.9	5.39	5.2
TMPF0604AV-1R5MN-ABD	1.5	12	16	17	13	6.4	7.04	5.2
TMPF0604AV-2R2MN-ABD	2.2	8.0	11	15.9	11.5	10.6	11.7	5.0
TMPF0604AV-3R3MN-ABD	3.3	7.0	9.2	12.3	9.6	14.1	15.5	5.0
TMPF0604AV-4R7MN-ABD	4.7	6.0	7.8	10.2	8.0	21	23.1	5.0
TMPF0604AV-5R6MN-ABD	5.6	5.0	6.7	9.8	7.8	25.5	28.1	5.0

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 125°C under worst case operating conditions.Circuit design,component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. I rms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 40V ref.

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A) Typ		I sat (A)		DCR (mΩ) Typ.	DCR (mΩ) Max.	D (mm) ±0.3
		20°C rise	40°C rise	Typ	Max			
TMPF0605AV-R82MN-ABD	0.82	16.0	21.0	24.0	20.0	3.8	4.18	5.3
TMPF0605AV-1R0MN-ABD	1.00	15.0	20.0	23.0	18.0	4.1	4.52	5.3
TMPF0605AV-1R2MN-ABD	1.20	14.0	18.0	22.0	16.0	5.3	5.83	5.3
TMPF0605AV-1R5MN-ABD	1.50	13.0	17.0	19.5	14.5	5.7	6.3	5.3
TMPF0605AV-1R8MN-ABD	1.80	12.0	16.0	18.5	13.5	6.4	7.1	5.3
TMPF0605AV-2R2MN-ABD	2.20	10.0	13.0	16.0	12.0	7.7	8.5	5.2
TMPF0605AV-3R3MN-ABD	3.30	8.5	11.0	12.5	10.0	11.2	12.5	5.2
TMPF0605AV-4R3MN-ABD	4.30	7.0	9.0	11.0	8.5	15.1	16.2	5.2
TMPF0605AV-4R7MN-ABD	4.70	6.5	8.5	10.5	8.4	16.7	18.4	5.2
TMPF0605AV-5R6MN-ABD	5.60	5.7	7.0	10.0	8.3	20.0	22.0	5.2
TMPF0605AV-6R8MN-ABD	6.80	5.2	6.6	9.0	7.0	23.1	25.4	5.2
TMPF0605AV-8R2MN-ABD	8.20	4.5	6.2	8.0	6.8	28.6	31.5	5.2

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 125°C under worst case operating conditions.Circuit design,component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. I rms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 40V ref.

Part Number	Inductance (uH) $\pm 20\%$ @ 0 A	I rms (A) Typ		I sat (A)		DCR (m Ω) Typ.	DCR (m Ω) Max.
		20 $^{\circ}$ C rise	40 $^{\circ}$ C rise	Typ	Max		
TMPF0606AV-1R0MN-ABD	1.00	16.0	21.0	24.0	19.0	4.0	4.4
TMPF0606AV-1R5MN-ABD	1.50	13.5	17.5	20.0	15.0	5.5	6.1
TMPF0606AV-2R2MN-ABD	2.20	11.0	14.0	16.5	12.5	7.3	8.1
TMPF0606AV-3R3MN-ABD	3.30	9.0	12.0	13.0	11.0	11.1	12.3
TMPF0606AV-4R7MN-ABD	4.70	8.5	11.0	11.5	9.5	15.1	16.2
TMPF0606AV-5R6MN-ABD	5.60	7.6	10.0	10.6	9.1	18.2	20.0

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25 $^{\circ}$ C ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25 C ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 155 $^{\circ}$ C under worst case operating conditions.Circuit design,component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. I rms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 40V ref

Part Number	Inductance (uH) $\pm 20\%$ @ 0 A	I rms (A) Typ		I sat (A)		DCR (m Ω) Typ.	DCR (m Ω) Max.
		20 $^{\circ}$ C rise	40 $^{\circ}$ C rise	Typ	Max		
TMPF0606LRV-R22MN-ABD	0.22	18.0	25.0	36.0	32.0	1.5	1.65
TMPF0606LRV-1R0MN-ABD	1.0	15.0	19.0	18.0	16.0	3.9	4.29
TMPF0606LRV-1R2MN-ABD	1.2	14.0	17.0	17.0	15.0	4.6	5.06
TMPF0606LRV-1R5MN-ABD	1.50	13.0	16.0	16.0	14.0	5.1	5.61
TMPF0606LRV-2R2MN-ABD	2.20	11.0	14.0	14.0	12.0	7.0	7.80
TMPF0606LRV-3R3MN-ABD	3.30	9.0	12.0	11.5	10.5	11.0	12.1
TMPF0606LRV-4R7MN-ABD	4.70	8.0	11.0	10.5	9.5	13.1	14.4
TMPF0606LRV-5R6MN-ABD	5.60	7.5	10.0	10.0	9.0	14.3	15.8
TMPF0606LRV-6R8MN-ABD	6.80	7.0	9.0	9.2	8.7	18.9	20.8
TMPF0606LRV-8R2MN-ABD	8.20	6.0	8.0	8.5	8.0	22.5	24.8

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25 $^{\circ}$ C ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25 C ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 125 $^{\circ}$ C under worst case operating conditions.Circuit design,component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. I rms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 15V ref.

Part Number	Inductance (μH) $\pm 20\%$ @ 0 A	I rms (A) Typ		I sat (A)		DCR ($\text{m}\Omega$) Typ.	DCR ($\text{m}\Omega$) Max.	D (mm) ± 0.3
		20 $^{\circ}\text{C}$ rise	40 $^{\circ}\text{C}$ rise	Typ	Max			
TMPF0702AV-R15MN-ABD	0.15	18	24	51	46	1.9	2.5	6.6
TMPF0702AV-R27MN-ABD	0.27	16	21	35	32	2.9	3.5	6.6
TMPF0702AV-R31MN-ABD	0.31	14	20	34	31	4.0	4.8	6.2
TMPF0702AV-R33MN-ABD	0.33	13	19	34	31	4.0	4.8	6.2
TMPF0702AV-R47MN-ABD	0.47	12	17	28	25	5.1	6.2	6.2
TMPF0702AV-R68MN-ABD	0.68	10	13	25	23	7.9	9.2	6.2
TMPF0702AV-1R0MN-ABD	1.00	8	11	23	20	9.8	10.8	6.2
TMPF0702AV-1R2MN-ABD	1.20	7	10	21	18	11.5	12.8	6.2
TMPF0702AV-1R5MN-ABD	1.50	6	9	17	15	16	17.6	6.2
TMPF0702AV-1R8MN-ABD	1.80	5.5	8	15	13	18	19.8	6.2

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25 $^{\circ}\text{C}$ ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25 $^{\circ}\text{C}$ ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 155 $^{\circ}\text{C}$ under worst case operating conditions. Circuit design, component, PCB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. Irms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 40V ref.

Part Number	Inductance (μH) $\pm 20\%$ @ 0 A	I rms (A) Typ		I sat (A)		DCR ($\text{m}\Omega$) Typ.	DCR ($\text{m}\Omega$) Max.	D (mm) ± 0.3
		20 $^{\circ}\text{C}$ rise	40 $^{\circ}\text{C}$ rise	Typ	Max			
TMPF0703AV-R60MN-ABD	0.60	18.0	23.0	36.0	32.0	2.90	3.20	6.6
TMPF0703AV-1R0MN-ABD	1.00	16.1	21.8	30.0	28.0	4.55	5.00	6.6
TMPF0703AV-1R5MN-ABD	1.50	12.0	15.3	25.0	23.5	7.50	8.25	6.6
TMPF0703AV-2R2MN-ABD	2.20	10.0	13.0	19.0	17.0	12.4	13.7	6.2
TMPF0703AV-2R7MN-ABD	2.70	9.20	11.4	16.0	13.5	14.0	15.4	6.2
TMPF0703AV-3R3MN-ABD	3.30	8.00	10.0	15.0	13.0	16.3	18.0	6.2
TMPF0703AV-4R7MN-ABD	4.70	6.90	9.00	13.5	12.2	24.2	26.7	6.2
TMPF0703AV-5R6MN-ABD	5.60	5.30	7.30	12.5	11.5	30.1	33.2	6.2

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25 $^{\circ}\text{C}$ ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25 $^{\circ}\text{C}$ ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 155 $^{\circ}\text{C}$ under worst case operating conditions. Circuit design, component, PCB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. Irms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 40V ref.

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A) Typ		I sat (A)		DCR (mΩ) Typ.	DCR (mΩ) Max.	D (mm) ±0.3
		20°C rise	40°C rise	Typ	Max			
TMPF0705AV-1R8MN-ABD	1.80	13.0	16.0	25	21	4.20	4.62	6.5
TMPF0705AV-2R2MN-ABD	2.20	11.0	14.0	21.0	17.0	5.8	6.4	6.2
TMPF0705AV-3R3MN-ABD	3.30	10.0	13.0	17.0	14.0	10.4	11.44	6.2
TMPF0705AV-4R7MN-ABD	4.70	8.5	11.0	15.0	13.0	14.0	15.4	6.2
TMPF0705AV-5R6MN-ABD	5.60	7.0	10.0	13.0	11.0	15.6	17.2	6.2

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 155°C under worst case operating conditions.Circuit design,component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. I rms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 40V ref.

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A) Typ		I sat (A)		DCR (mΩ) Typ.	DCR (mΩ) Max.	D (mm) ±0.3
		20°C rise	40°C rise	Typ	Max			
TMPF0707AV-2R2MN-ABD	2.20	13.2	17.8	19.6	17.6	5.73	6.33	6.70
TMPF0707AV-3R3MN-ABD	3.30	11.5	15.1	19.4	15.1	8.56	9.42	6.70
TMPF0707AV-4R7MN-ABD	4.70	10.5	13.6	15.5	14.0	12.2	13.5	6.70
TMPF0707AV-5R6MN-ABD	5.60	8.5	11.4	14.1	12.0	13.67	15.03	6.50
TMPF0707AV-6R8MN-ABD	6.80	7.0	9.5	12.8	11.0	17.8	19.6	6.50
TMPF0707AV-100MN-ABD	10.0	5.0	7.0	10.0	9.0	24.0	26.4	6.50

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 155°C under worst case operating conditions.Circuit design,component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. I rms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 40V ref.

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A) Typ		I sat (A)		DCR (mΩ) Typ.	DCR (mΩ) Max.	D (mm) ±0.4
		20°C rise	40°C rise	Typ	Max			
TMPF0808AV-3R3MN-ABD	3.30	13.5	18.0	23.0	20.0	6.6	7.3	6.9
TMPF0808AV-4R7MN-ABD	4.70	10.5	14.6	19.0	17.0	8.9	9.8	6.9
TMPF0808AV-6R8MN-ABD	6.80	8.0	11.3	14.5	12.5	13.0	14.3	6.9
TMPF0808AV-100MN-ABD	10.0	6.6	8.7	11.0	10.0	20.8	22.9	6.9

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 155°C under worst case operating conditions.Circuit design,component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. I rms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 40V ref

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A) Typ		I sat (A)		DCR (mΩ) Typ.	DCR (mΩ) Max.	D(mm) ±0.5
		20°C rise	40°C Rise	Typ	Max			
TMPF1006AV-2R2MN-ABD	2.20	14.0	20.0	35.0	30.0	4.40	4.84	9.0
TMPF1006AV-3R3MN-ABD	3.30	11.4	16.8	28.0	25.0	7.00	7.70	9.0
TMPF1006AV-4R7MN-ABD	4.70	8.7	14.0	25.0	22.0	9.70	10.72	9.0
TMPF1006AV-5R6MN-ABD	5.60	7.0	12.0	20.0	17.0	10.8	11.9	8.8
TMPF1006AV-6R8MN-ABD	6.80	6.0	10.5	18.0	15.5	11.8	13.0	8.8
TMPF1006AV-8R2MN-ABD	8.20	5.0	9.5	16.5	14.0	15.0	16.5	8.8
TMPF1006AV-100MN-ABD	10.0	4.5	9.0	15.0	13.0	16.5	18.2	8.8

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 155°C under worst case operating conditions.Circuit design,component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. Irms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 40V ref.

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A) Typ		I sat (A)		DCR (mΩ) Typ.	DCR (mΩ) Max.	D (mm) ±0.5
		20°C rise	40°C Rise	Typ	Max			
TMPF1010AV-3R3MN-ABD	3.30	18.2	25.0	27.4	23.4	3.7	4.1	9.3
TMPF1010AV-4R7MN-ABD	4.70	17.5	24.0	25.4	21.4	5.2	5.7	9.3
TMPF1010AV-5R6MN-ABD	5.60	15.7	21.2	23.6	19.6	6.5	7.2	9.3
TMPF1010AV-6R8MN-ABD	6.80	14.0	18.5	21.8	18.5	8.1	8.9	9.0
TMPF1010AV-8R2MN-ABD	8.20	12.9	17.1	18.3	16.3	10.8	12.4	9.0
TMPF1010AV-100MN-ABD	10.0	11.5	15.5	17.5	14.6	12.5	13.75	9.0
TMPF1010AV-150MN-ABD	15.0	9.9	13.8	15.5	12.5	17.5	19.30	9.0

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 155°C under worst case operating conditions.Circuit design,component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. Irms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 40V ref.

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A) Typ		I sat (A)		DCR (mΩ) Typ.	DCR (mΩ) Max.
		20°C rise	40°C rise	Typ	Max		
TMPF1031LRV-R28MN-ABD	0.28	25.5	35.0	65.0	58.0	1.45	1.60
TMPF1031LRV-R56MN-ABD	0.56	23.0	32.0	44.0	39.0	2.50	2.75
TMPF1031LRV-R82MN-ABD	0.82	18.0	25.0	38.0	32.0	3.70	4.10
TMPF1031LRV-R90MN-ABD	0.90	17.0	24.0	36.0	31.0	3.80	4.20
TMPF1031LRV-1R0MN-ABD	1.00	16.0	23.0	35.0	30.0	4.50	4.95
TMPF1031LRV-1R5MN-ABD	1.50	12.0	18.0	30.0	25.0	6.00	6.60

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 155°C under worst case operating conditions.Circuit design,component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. I rms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 15V ref.

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A) Typ		I sat (A)		DCR (mΩ) Typ.	DCR (mΩ) Max.
		20°C rise	40°C Rise	Typ	Max		
TMPF1508AV-2R0MN-ABD	2.00	29.5	40.0	57.0	52.0	1.92	2.21
TMPF1508AV-2R2MN-ABD	2.20	28.0	37.0	55.0	49.0	2.15	2.48
TMPF1508AV-3R0MN-ABD	3.00	26.0	34.5	46.0	41.0	2.50	3.00
TMPF1508AV-4R2MN-ABD	4.20	20.5	27.0	38.0	33.0	3.90	4.68
TMPF1508AV-4R7MN-ABD	4.70	20.0	26.5	37.0	32.0	4.30	5.16
TMPF1508AV-5R3MN-ABD	5.30	19.5	26.0	35.0	31.0	4.45	5.34
TMPF1508AV-6R2MN-ABD	6.20	17.0	23.0	34.0	31.0	5.40	6.50
TMPF1508AV-7R2MN-ABD	7.20	15.0	21.0	32.0	29.0	6.00	7.20
TMPF1508AV-8R2MN-ABD	8.20	13.0	19.0	28.0	25.0	6.60	7.92
TMPF1508AV-100MN-ABD	10.0	11.0	16.0	24.0	21.0	8.00	9.60
TMPF1508AV-150MN-ABD	15.0	10.0	13.0	21.0	18.0	12.50	15.00
TMPF1508AV-220MN-ABD	22.0	9.0	12.0	19.0	16.0	19.30	23.20

Note:

1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 155°C under worst case operating conditions.Circuit design,component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. I rms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 40V ref.

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A)		I sat (A)		DCR (mΩ) Typ.	DCR (mΩ) Max.
		20°C rise	40°C Rise	Typ	Max		
TMPF1510AV-4R7MN-ABD	4.7	22.0	30.0	43.0	39.0	3.40	3.80
TMPF1510AV-5R6MN-ABD	5.6	21.0	28.0	38.0	34.0	3.82	4.20
TMPF1510AV-6R8MN-ABD	6.8	20.0	26.0	36.0	31.0	4.18	4.60
TMPF1510AV-8R2MN-ABD	8.2	19.0	25.0	32.0	28.0	6.00	7.20
TMPF1510AV-100MN-ABD	10.0	18.0	24.0	29.0	26.0	7.10	8.60
TMPF1510AV-150MN-ABD	15.0	14.0	18.0	23.0	20.0	9.20	11.50
TMPF1510AV-220MN-ABD	22.0	11.0	16.0	20.0	18.0	13.2	15.8
TMPF1510AV-330MN-ABD	33.0	9.0	13.0	18.7	16.7	18.7	20.0

Note:

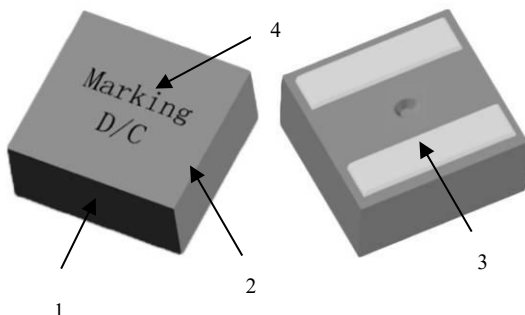
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2. All test data referenced to 25°C ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 155°C under worst case operating conditions.Circuit design,component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. I rms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 40V ref.

Part Number	Inductance (uH) ±20% @ 0 A	I rms (A)		I sat (A)		DCR (mΩ) Typ.	DCR (mΩ) Max.
		20°C rise	40°C Rise	Typ	Max		
TMPF1513AV-4R7MN-ABD	4.70	23.0	31.0	44.0	40.0	3.0	3.3
TMPF1513AV-5R6MN-ABD	5.60	22.0	29.0	40.0	35.0	3.5	3.9
TMPF1513AV-6R8MN-ABD	6.80	21.0	27.0	37.0	32.0	3.8	4.2
TMPF1513AV-8R2MN-ABD	8.20	20.0	26.0	33.0	29.0	5.1	5.74
TMPF1513AV-100MN-ABD	10.0	19.0	25.0	30.0	27.0	6.3	7.0
TMPF1513AV-150MN-ABD	15.0	16.0	22.0	25.5	21.0	6.8	7.5
TMPF1513AV-220MN-ABD	22.0	12.0	17.0	22.0	19.0	12.6	13.86
TMPF1513AV-330MN-ABD	33.0	9.0	14.0	19.0	16.0	18.5	22.2

Note:

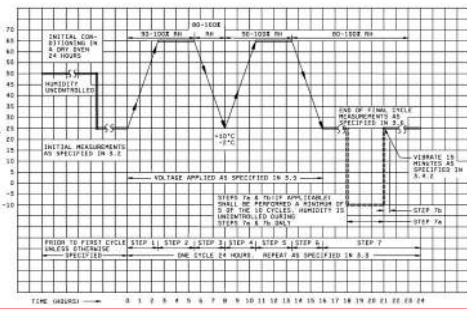
1. Test frequency : L : 100KHz /0.1V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L: HP4284A,HP4395A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER,or EQU.
4. Current that causes the specified temperature rise from 25°C ambient.
5. Saturation Current (Isat) will cause L0 to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 155°C under worst case operating conditions.Circuit design,component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
7. Special inquiries besides the above common used types can be met on your requirement.
8. I rms Testing: Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.
9. Rated operating voltage(across inductor) 40V ref.

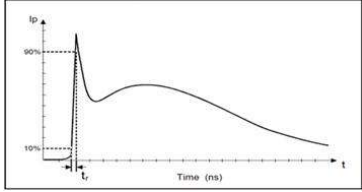
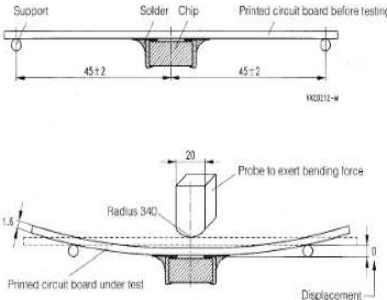
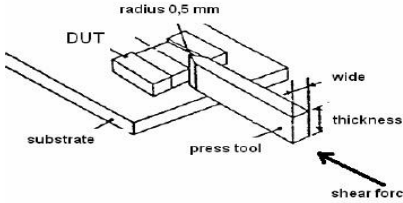
6. Material List



NO	Items	Materials
1	Core	Alloy powder.
2	Wire	Polyester Wire or equivalent.
3	Solder	100% Pb free solder
4	Ink	Halogen-free ketone

7. Reliability and Test Condition

Item	Performance	Test Condition															
Operating temperature	-55~+155°C (Including self - temperature rise)																
Storage temperature and Humidity range	1. -10~+40°C, 50~60%RH (Product with taping) 2. -55~+155°C (on board)																
Electrical Performance Test																	
Inductance	Refer to standard electrical characteristics list.	HP4284A, CH11025, CH3302, CH1320, CH1320S LCR Meter.															
DCR		CH16502, Agilent33420A Micro-Ohm Meter.															
Saturation Current (Isat)	Approximately Δ L30%	Saturation DC Current (Isat) will cause L0 to drop Δ L(%)															
Heat Rated Current (Irms)	Approximately Δ T40°C	Heat Rated Current (Irms) will cause the coil temperature rise Δ T(°C). 1. Applied the allowed DC current 2. Temperature measured by digital surface thermometer															
Reliability Test																	
High Temperature Exposure(Storage) AEC-Q200	Appearance : No damage. Inductance : within \pm 10% of initial value RDC : within \pm 15% of initial value and shall not exceed the specification value	Preconditioning: Run through IR reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles Temperature: 155 \pm 2°C (Inductor) Duration : 1000hrs Min. Measured at room temperature after placing for 24 \pm 2 hrs															
Temperature Cycling AEC-Q200		Preconditioning: Run through IR reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles Condition for 1 cycle Step1: -55 \pm 2°C 30min Min.(Inductor) Step2: 155 \pm 2°C transition time 1min MAX. Step3: 155 \pm 2°C 30min Min. Step4: Low temp. transition time 1min MAX. Number of cycles: 1000 Measured at room temperature after placing for 24 \pm 2 hrs															
Moisture Resistance (AEC-Q200)		t=24 hours/cycle. Note:Steps 7a & 7b Unpowered. 															
Biased Humidity (AEC-Q200)		Preconditioning: Run through IR reflow for 3 times. (IPC/JEDEC J-STD-020E Classification Reflow Profiles) Humidity : 85 \pm 3% R.H. Temperature: 85 \pm 2°C Duration : 1000hrs Min Measured at room temperature after placing for24 \pm 2hrs															
High Temperature Operational Life (AEC-Q200)	Preconditioning: Run through IR reflow for 3 times. (IPC/JEDEC J-STD-020E Classification Reflow Profiles Temperature: 155 \pm 2°C (Inductor) Duration : 1000hrs Min. With 100% rated current. Measured at room temperature after placing for24 \pm 2hrs																
External Visual	Appearance : No damage.	Inspect device construction, marking and workmanship. Electrical Test not required.															
Physical Dimension	According to the product specification size measurement	According to the product specification size measurement															
Resistance to Solvents	Appearance : No damage.	Add aqueous wash chemical - OKEM clean or equivalent.															
Mechanical Shock	Appearance : No damage. Inductance : within \pm 10% of initial value RDC : within \pm 15% of initial value and shall not exceed the specification value	Preconditioning: Run through IR reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles) Test condition <table border="1" data-bbox="917 1989 1385 2116"> <thead> <tr> <th>Type</th> <th>Peak value (g's)</th> <th>Normal duration (D) (ms)</th> <th>Wave form</th> <th>Velocity change (Vi)ft/sec</th> </tr> </thead> <tbody> <tr> <td>SMD</td> <td>100</td> <td>6</td> <td>Half-sine</td> <td>12.3</td> </tr> <tr> <td>Lead</td> <td>100</td> <td>6</td> <td>Half-sine</td> <td>12.3</td> </tr> </tbody> </table> 3 shocks in each direction along 3 perpendicular axes(18 shocks).	Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec	SMD	100	6	Half-sine	12.3	Lead	100	6	Half-sine	12.3
Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec													
SMD	100	6	Half-sine	12.3													
Lead	100	6	Half-sine	12.3													

Item	Performance	Test Condition						
Vibration		Preconditioning: Run through IR reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles) Oscillation Frequency: 10Hz~2KHz~10Hz for 20 minute Equipment : Vibration checker Total Amplitude: 5g Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations)						
Resistance to Soldering Heat	Appearance : No damage. Inductance : within±10% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	Test condition:(MIL-STD-202 Condition B) Number of heat cycles:1 <table border="1" data-bbox="927 360 1297 461"> <thead> <tr> <th>Temperature(°C)</th> <th>Time(s)</th> <th>Temperature ramp/immersion and emersion rate</th> </tr> </thead> <tbody> <tr> <td>260±5 (solder temp)</td> <td>10±1</td> <td>25mm/s±6mm/s</td> </tr> </tbody> </table> Depth: completely cover the termination	Temperature(°C)	Time(s)	Temperature ramp/immersion and emersion rate	260±5 (solder temp)	10±1	25mm/s±6mm/s
Temperature(°C)	Time(s)	Temperature ramp/immersion and emersion rate						
260±5 (solder temp)	10±1	25mm/s±6mm/s						
Thermal shock (AEC-Q200)		Preconditioning: Run through IR reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles Condition for 1 cycle Step1: -55±2°C 15±1min(Inductor) Step2: 155±2°C within 20Sec. Step3: 155±2°C 15±1min Number of cycles : 300 Measured at room tempraturc after placing fo24±2hrs						
ESD	Appearance : No damage.	 <p>Direct Contact and Air Discharge PASSIVE COMPONENT HBM ESD Discharge Waveform to a Coaxial Target Test method: AEC-Q200-002 Test mode: Contact Discharge Discharge level: 4 KV (Level: 2)</p>						
Solderability	More than 95% of the terminal electrode should be covered with solder ◦	a. Method B1, 4 hrs @155°C dry heat @255°C±5°C Test time:5 +0/-0.5 seconds. b. Method D category 3. (steam aging 8hours ± 15 min)@ 260°C±5°C Test time: 30 +0/-0.5 seconds.						
Electrical Characterization	Refer Specification for Approval	Summary to show Min, Max, Mean and Standard deviation .						
Flammability	Electrical Test not required.	V-0 or V-1 are acceptable.						
Board Flex	Appearance : No damage	Preconditioning: Run through IR reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles Place the 100mm X 40mm board into a fixture similar to the one shown in below Figure with the component facing down. The apparatus shall consist of mechanical means to apply a force which will bend the board (D) x = 2 mm minimum. The duration of the applied forces shall be 60 (+ 5) sec. The force is to be applied only once to the board. 						
Terminal Strength(SMD)	Appearance : No damage	Preconditioning: Run through IR reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles With the component mounted on a PCB with the device to be tested, apply a 17.7 N (1.8 Kg) force to the side of a device being tested. This force shall be applied for 60 +1 seconds. Also the force shall be applied gradually as not to apply a shock to the component being tested. 						

Note : When there are questions concerning measurement result : measurement shall be made after 48 ± 2 hours of recovery under the standard condition.

8.Soldering Specifications

(1) Soldering

Mildly activated rosin fluxes are preferred. TAI-TECH terminations are suitable for re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

(2) Soldering Reflow:

Recommended temperature profiles for lead free re-flow soldering in Figure 1. Table 1.1&1.2 (J-STD-020E)

(3) Iron Reflow:

Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended.(Fig. 2)

- Preheat circuit and products to 150°C
- Never contact the ceramic with the iron tip
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- 355°C tip temperature (max)
- 1.0mm tip diameter (max)
- Limit soldering time to 4~5sec.

Fig.1 Soldering Reflow

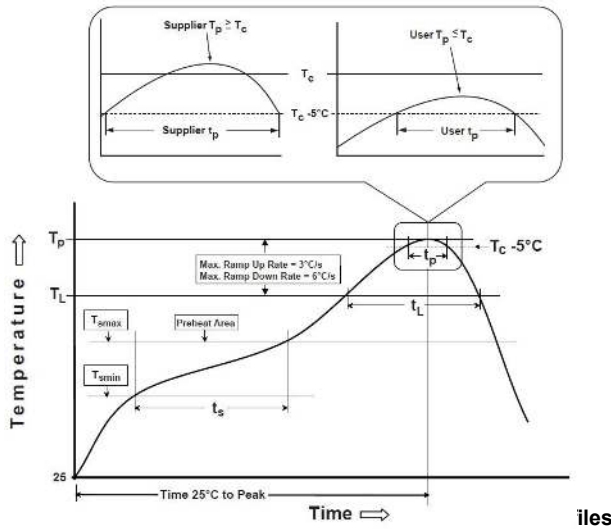
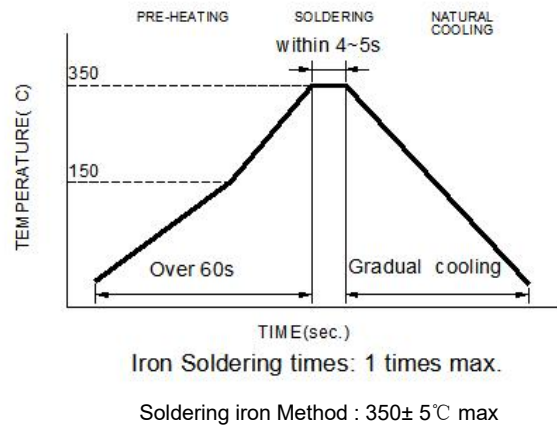


Fig.2 Iron soldering temperature profiles



Profile Type:	Pb-Free Assembly
Preheat -Temperature Min(T_{smin}) -Temperature Max(T_{smax}) -Time(t_s)from(T_{smin} to T_{smax})	150°C 200°C 60-120seconds
Ramp-up rate(T_L to T_p)	3°C/second max.
Liquidus temperature(T_L) Time(t_L)maintained above T_L	217°C 60-150 seconds
Classification temperature(T_c)	See Table (1.2)
Time(t_p) at $T_c - 5^\circ\text{C}$ (T_p should be equal to or less than T_c .)	< 30 seconds
Ramp-down rate(T_p to T_L)	6°C /second max.
Time 25°C to peak temperature	8 minutes max.

T_p : maximum peak package body temperature, T_c : the classification temperature.
For user (customer) T_p should be equal to or less than T_c .

Table (1.2) Package Thickness/Volume and Classification Temperature (T_c)

	Package Thickness	Volume mm ³ <350	Volume mm ³ 350-2000	Volume mm ³ >2000
PB-Free Assembly	<1.6mm	260°C	260°C	260°C
	1.6-2.5mm	260°C	250°C	245°C
	≥2.5mm	250°C	245°C	245°C

Reflow is referred to standard IPC/JEDEC J-STD-020E ◦

9. Notes

- (1) When there are questions concerning measurement result : measurement shall be made after 48 ± 2 hours of recovery under the standard condition
- (2) This power choke coil itself does not have any protective function in abnormal condition such as overload, short-circuit and open-circuit conditions, etc. Therefore, it shall be confirmed as the end product that there is no risk of smoking, fire, dielectric withstand voltage, insulation resistance, etc. in abnormal conditions to provide protective devices and/or protection circuit in the end product.
- (3) When this power choke coil was used in a similar or new product to the original one, sometimes it might not be able to satisfy the specifications due to different condition of use.
- (4) Dielectric withstanding test with higher voltage than specific value will damage insulating material and shorten its life.
- (5) This power choke coil must not be used in wet condition by water, coffee or any liquid because insulation strength becomes very low in this condition.
- (6) Please consult our company to confirm the reliability of the process required to wash or use or exposure to a chemical solvent used in this product. PCB washing tested to MIL-STD-202 Method 1 and dry it off immediately .
- (7) The rated current as listed is either the saturation current or the heating current depending on which value is lower.
- (8) If this power choke is dipped in the cleaning agent, such as toluene, xylene, ketone, and ether system, there is a possibility that the performance decreases greatly , and marking disappears .
- (9) The high power ultrasonic washing may damage the choke body .
- (10) Before use, the user should determine whether this product is suitable for their own design, Our company only guarantees that the product meets the requirements of this specification .

Application Notice

- Storage Conditions

To maintain the solderability of terminal electrodes:

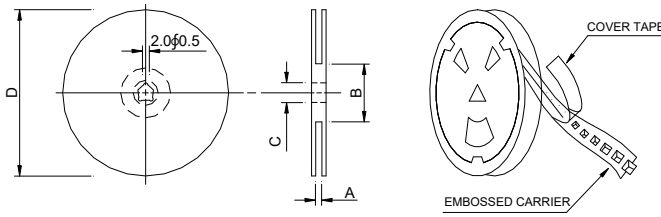
1. TAI-TECH products meet IPC/JEDEC J-STD-020E standard-MSL, level 1.
2. Temperature and humidity conditions: Less than 40°C and 60% RH.
3. Recommended products should be used within 12 months from the time of delivery.
4. The packaging material should be kept where no chlorine or sulfur exists in the air.

- Transportation

1. Products should be handled with care to avoid damage or contamination from perspiration and skin oils.
2. The use of tweezers or vacuum pick up is strongly recommended for individual components.
3. Bulk handling should ensure that abrasion and mechanical shock are minimized.

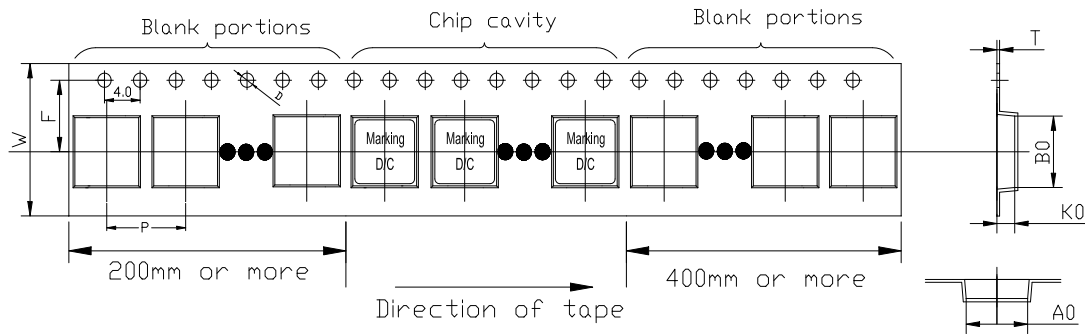
10. Packaging Information

(1) Reel Dimension



Size	Type	A(mm)	B(mm)	C(mm)	D(mm)
0402A/LR	13"x12mm	12.4+2/-0	100±2	13+0.5/-0.2	330
0403A/LR	13"x12mm	12.4+2/-0	100±2	13+0.5/-0.2	330
0502A	13"x12mm	12.4+2/-0	100±2	13+0.5/-0.2	330
0503A	13"x16mm	16.4+2/-0	100±2	13+0.5/-0.2	330
0505LR	13"x16mm	16.4+2/-0	100±2	13+0.5/-0.2	330
0603A	13"x16mm	16.4+2/-0	100±2	13+0.5/-0.2	330
0605A	13"x16mm	16.4+2/-0	100±2	13+0.5/-0.2	330
0606LR	13"x16mm	16.4+2/-0	100±2	13+0.5/-0.2	330
0702A	13"x16mm	16.4+2/-0	100±2	13+0.5/-0.2	330
0703A	13"x16mm	16.4+2/-0	100±2	13+0.5/-0.2	330
0705A	13"x16mm	16.4+2/-0	100±2	13+0.5/-0.2	330
0707A	13"x16mm	16.4+2/-0	100±2	13+0.5/-0.2	330
0808A	13"x24mm	24.4+2/-0	100±2	13+0.5/-0.2	330
1006A	13"x24mm	24.4+2/-0	100±2	13+0.5/-0.2	330
1010A	13"x24mm	24.4+2/-0	100±2	13+0.5/-0.2	330
1031LR	13"x24mm	24.4+2/-0	100±2	13+0.5/-0.2	330
1508A	13"x32mm	32.4+2/-0	100±2	13+0.5/-0.2	330
1510A	13"x32mm	32.4+2/-0	100±2	13+0.5/-0.2	330
1513A	13"x32mm	32.4+2/-0	100±2	13+0.5/-0.2	330

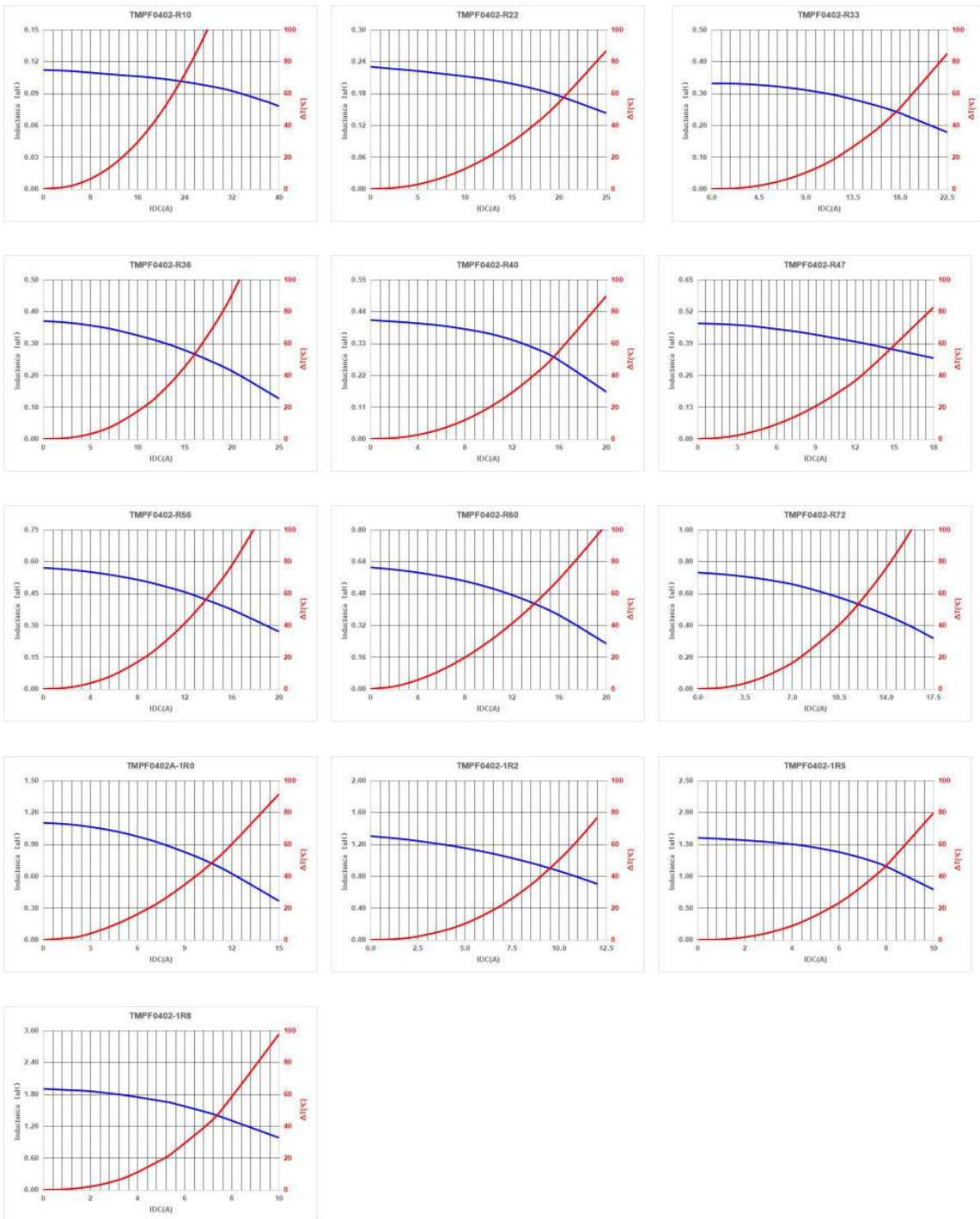
(2) Tape Dimension



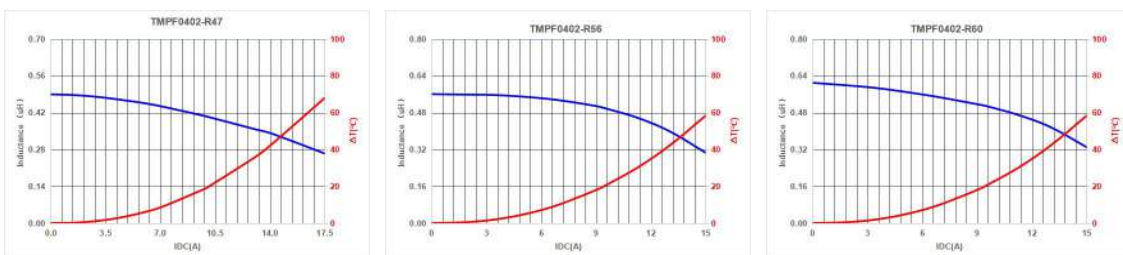
Series	Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	W(mm)	F(mm)	t(mm)	D(mm)	Packaging Quantity
TMPF	0402	4.7±0.1	4.7±0.1	2.3±0.1	8.0±0.1	12±0.3	5.5±0.1	0.35±0.1	1.5±0.1	3000PCS/R
TMPF	0403	4.7±0.1	4.7±0.1	3.3±0.1	8.0±0.1	12±0.3	5.5±0.1	0.35±0.1	1.5±0.1	2000PCS/R
TMPF	0502	6.1±0.1	6.4±0.1	2.3±0.1	8.0±0.1	12.0±0.3	5.5±0.1	0.35±0.05	1.5±0.1	3000PCS/R
TMPF	0503	6.1±0.1	6.4±0.1	3.3±0.1	8.0±0.1	16.0±0.3	7.5±0.1	0.35±0.05	1.5±0.1	2000PCS/R
TMPF	0505	6.1±0.1	6.4±0.1	5.3±0.1	8.0±0.1	16.0±0.3	7.5±0.1	0.35±0.05	1.5±0.1	1500PCS/R
TMPF	0603	7.3±0.1	7.6±0.1	3.3±0.1	12.0±0.1	16±0.3	7.5±0.1	0.35±0.05	1.5±0.1	1000PCS/R
TMPF	0604	7.3±0.1	7.6±0.1	4.3±0.1	12.0±0.1	16±0.3	7.5±0.1	0.35±0.1	1.5±0.1	800PCS/R
TMPF	0605	7.3±0.1	7.6±0.1	5.3±0.1	12.0±0.1	16±0.3	7.5±0.1	0.35±0.1	1.5±0.1	800PCS/R
TMPF	0606	6.3±0.1	7.6±0.1	6.3±0.1	12.0±0.1	16±0.3	7.5±0.1	0.35±0.1	1.5±0.1	750PCS/R
TMPF	0702	8.4±0.1	8.8±0.1	2.3±0.1	12.0±0.1	16±0.3	7.5±0.1	0.35±0.1	1.5±0.1	2000PCS/R
TMPF	0703	8.4±0.1	8.8±0.1	3.3±0.1	12.0±0.1	16±0.3	7.5±0.1	0.35±0.1	1.5±0.1	1500PCS/R
TMPF	0705	8.4±0.1	8.8±0.1	5.3±0.1	12.0±0.1	16±0.3	7.5±0.1	0.35±0.1	1.5±0.1	800PCS/R
TMPF	0707	8.4±0.1	8.8±0.1	7.3±0.1	12.0±0.1	16±0.3	7.5±0.1	0.35±0.1	1.5±0.1	700PCS/R
TMPF	0808	8.9±0.1	9.4±0.1	8.5±0.1	16.0±0.1	24±0.3	7.5±0.1	0.35±0.1	1.5±0.1	450PCS/R
TMPF	1006	11.5±0.1	12.4±0.1	6.3±0.1	16.0±0.1	24±0.3	11.5±0.1	0.35±0.1	1.5±0.1	500PCS/R
TMPF	1010	11.5±0.1	12.4±0.1	10.3±0.1	16.0±0.1	24±0.3	11.5±0.1	0.35±0.1	1.5±0.1	300PCS/R
TMPF	1031	11.5±0.1	12.4±0.1	3.3±0.1	16.0±0.1	24±0.3	11.5±0.1	0.35±0.1	1.5±0.1	1000PCS/R
TMPF	1508	17.0±0.1	18.0±0.1	8.5±0.1	24.0±0.1	32.0±0.3	14.2±0.1	0.50±0.05	1.5±0.1	200PCS/R
TMPF	1510	17.0±0.1	18.0±0.1	10.5±0.1	24.0±0.1	32.0±0.3	14.2±0.1	0.50±0.05	1.5±0.1	150PCS/R
TMPF	1513	17.0±0.1	18.0±0.1	13.6±0.1	24.0±0.1	32.0±0.3	14.2±0.1	0.50±0.05	1.5±0.1	100PCS/R

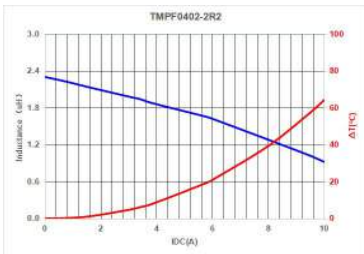
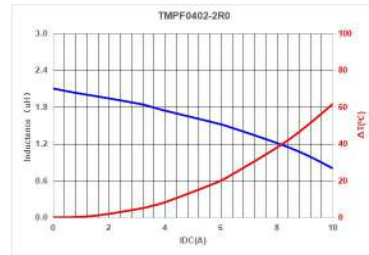
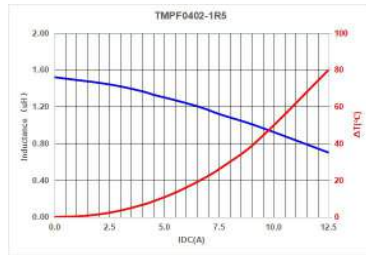
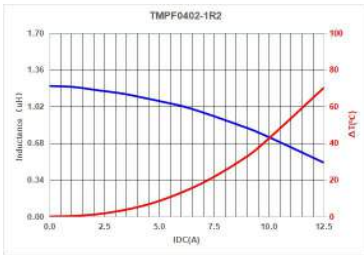
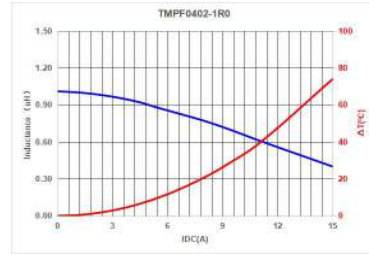
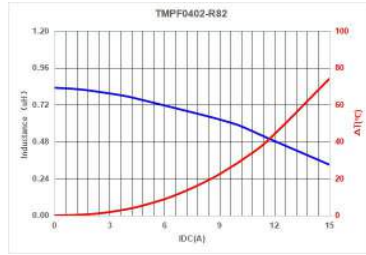
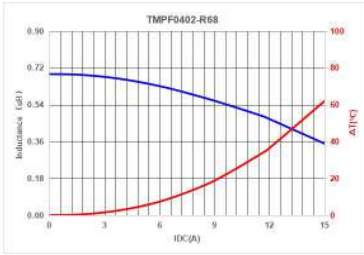
11. Typical Performance Curves

TMPF0402A

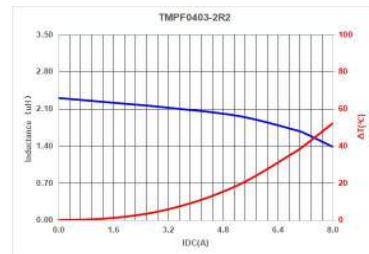
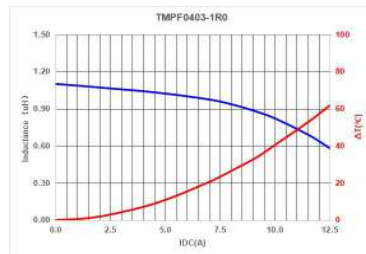
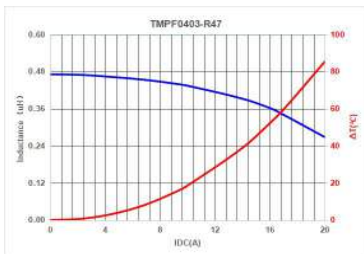


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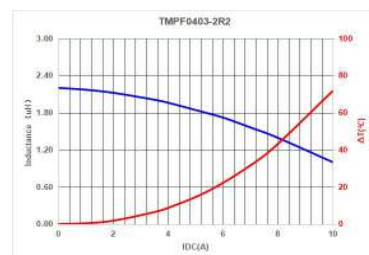
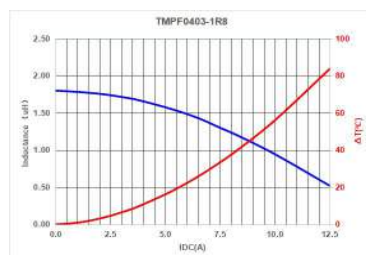
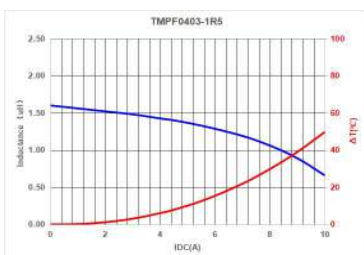
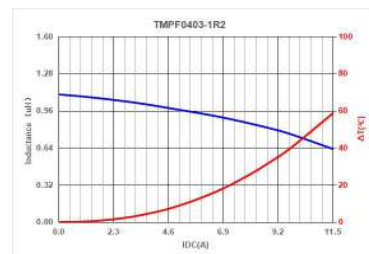
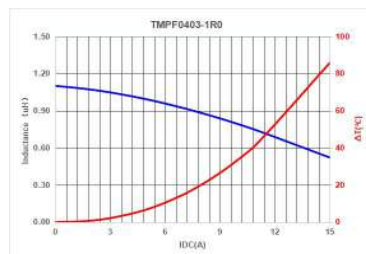
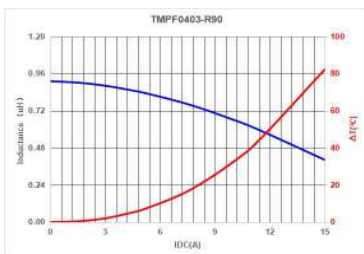


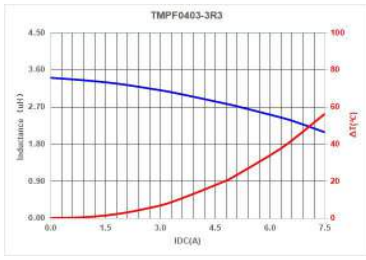


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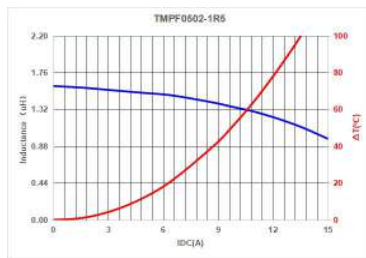
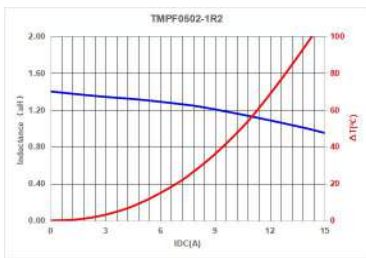
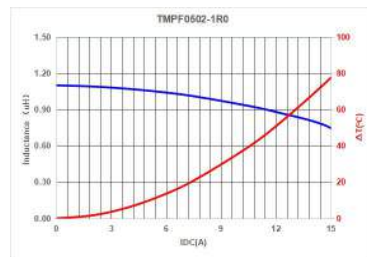
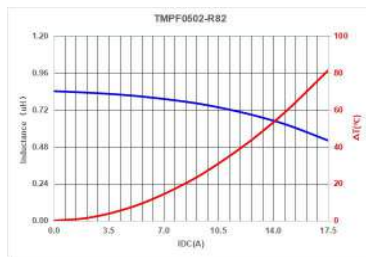
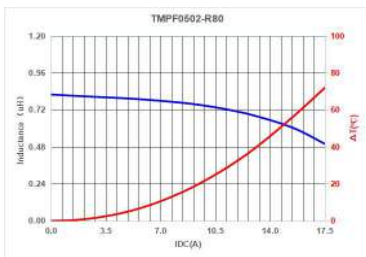
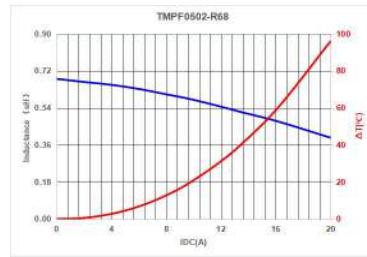
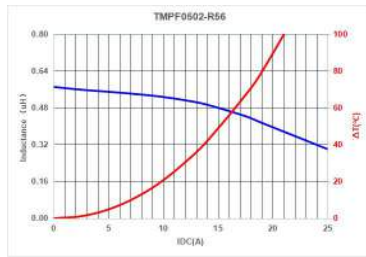
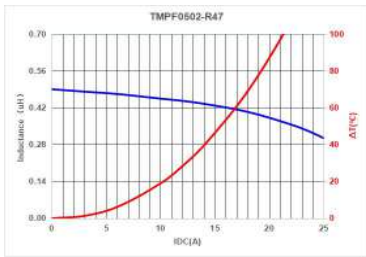
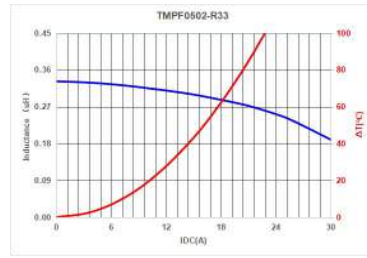
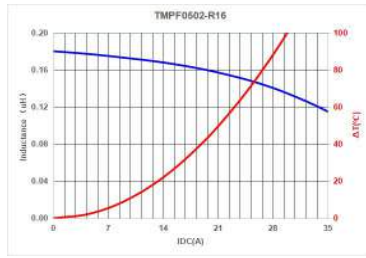
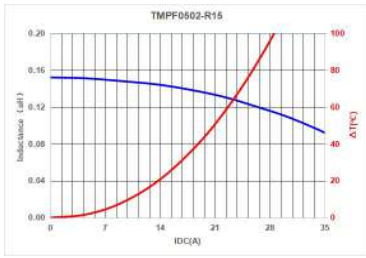


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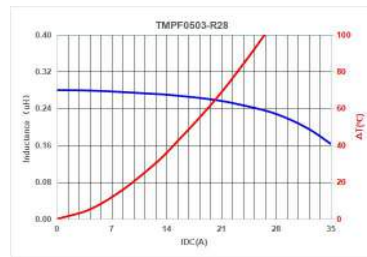
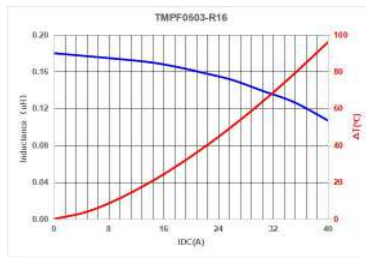
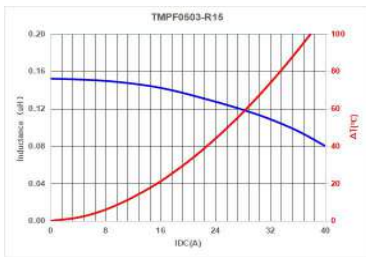


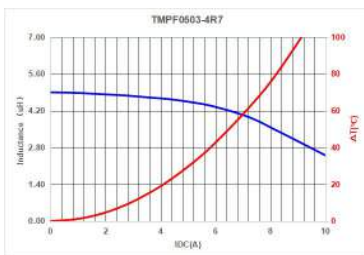
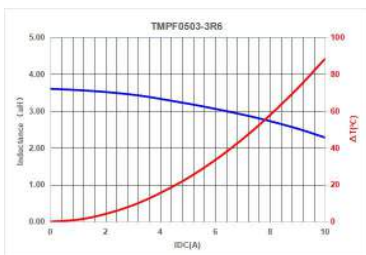
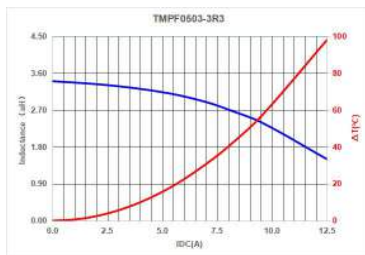
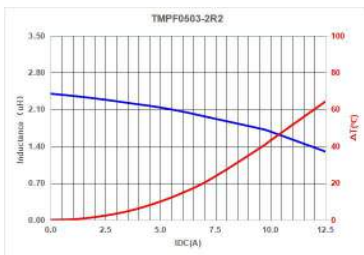
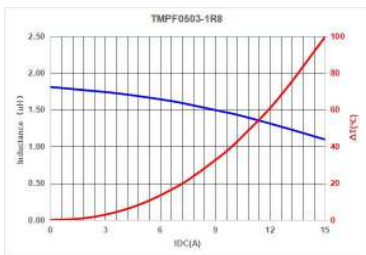
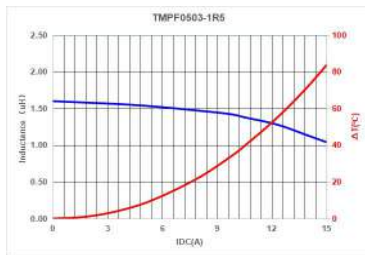
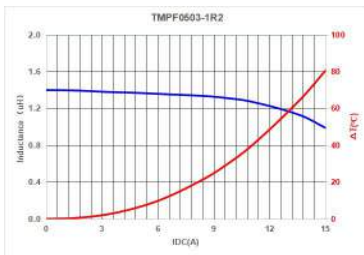
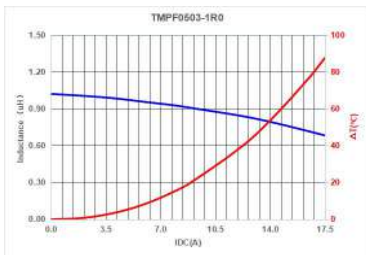
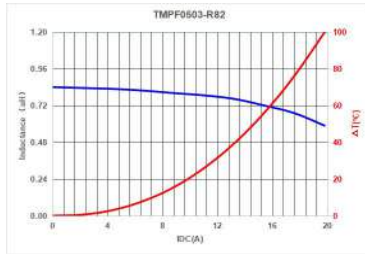
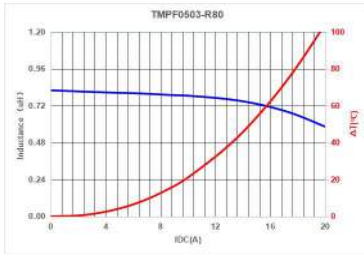
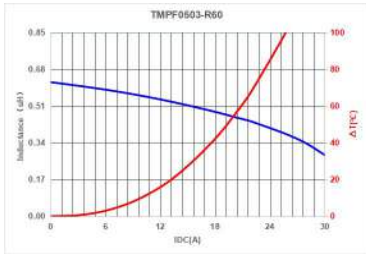
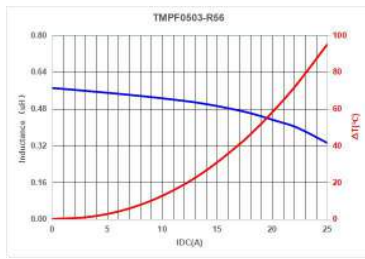
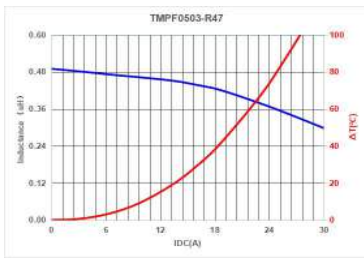
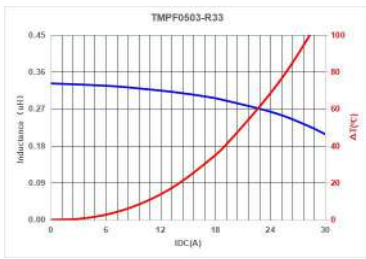


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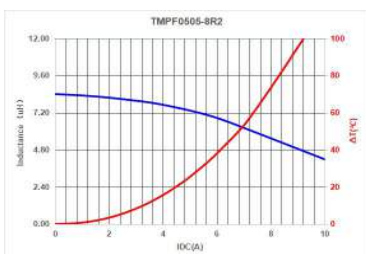
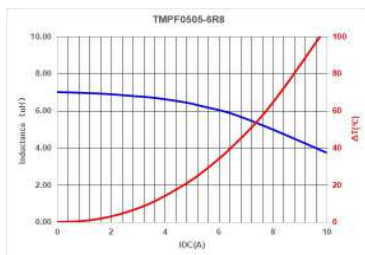
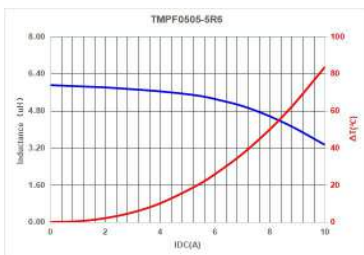
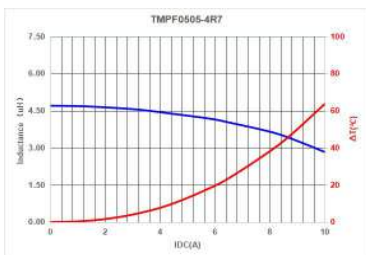


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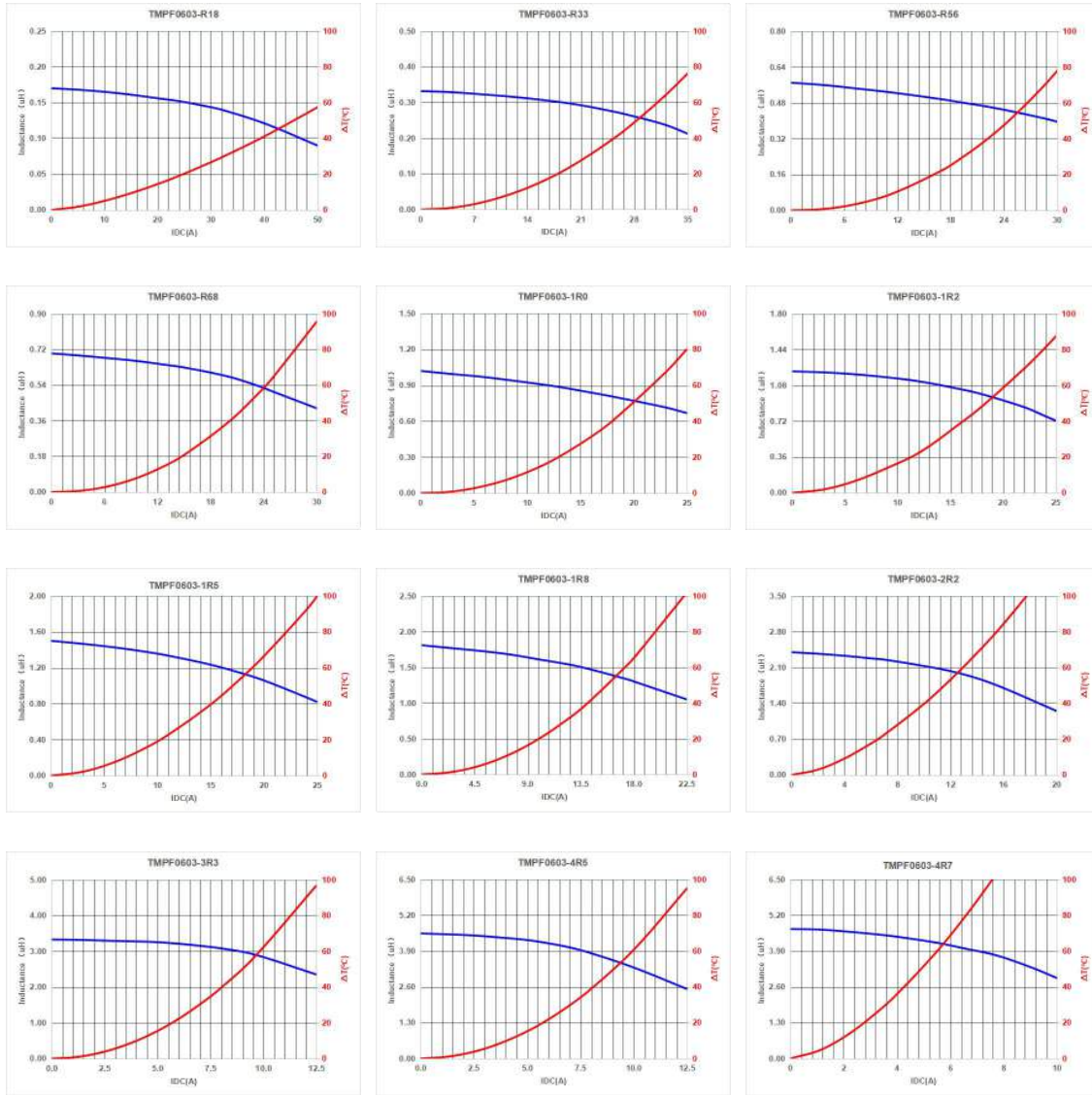




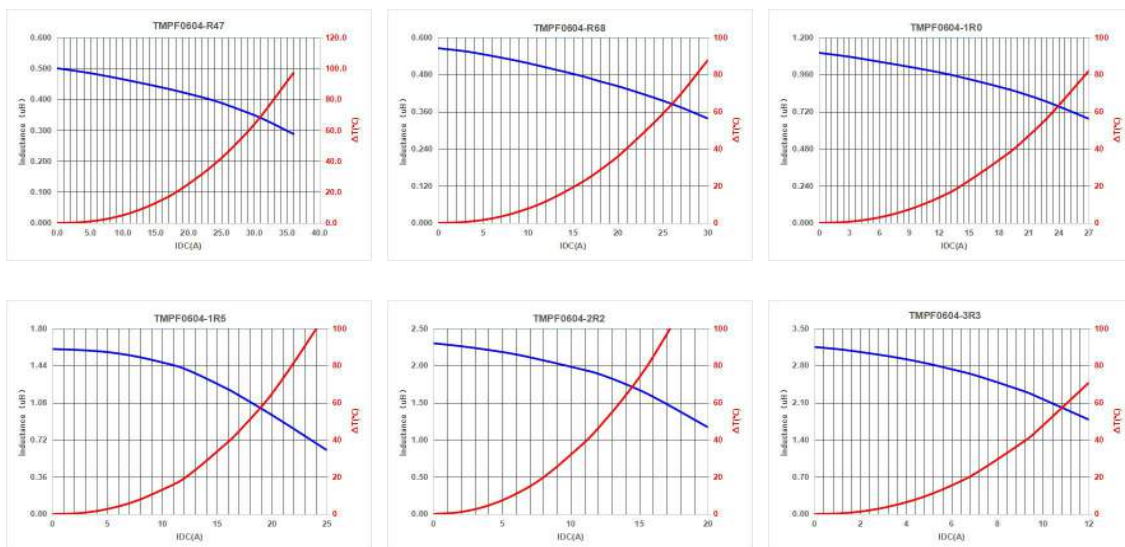
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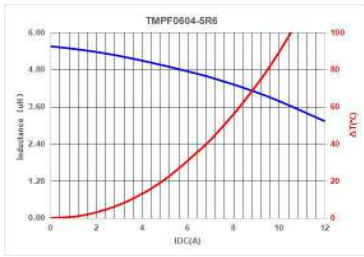
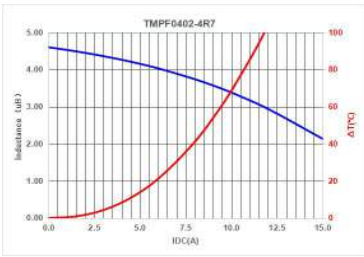


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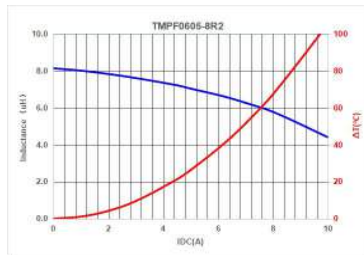
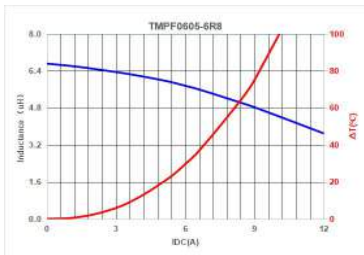
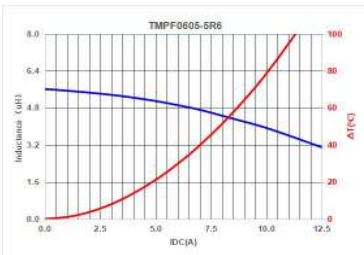
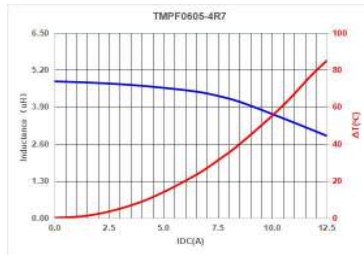
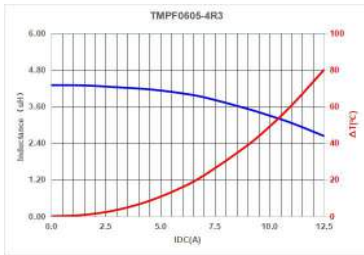
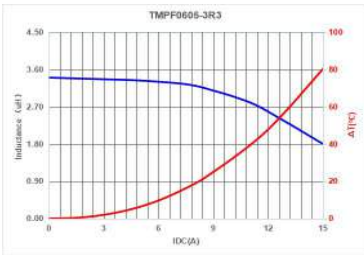
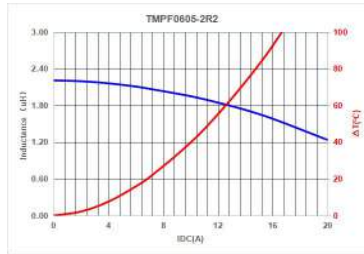
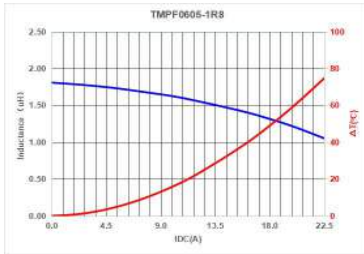
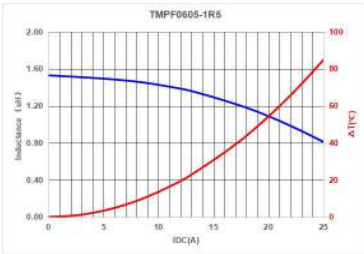
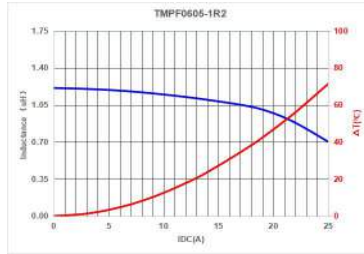
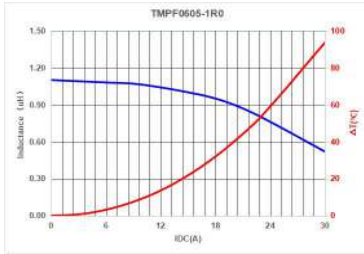
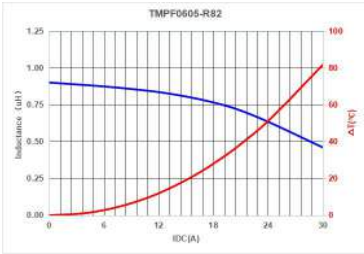


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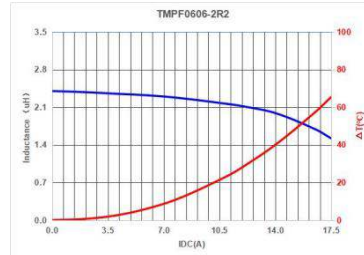
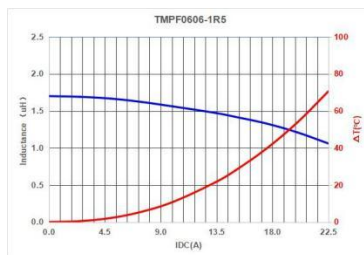
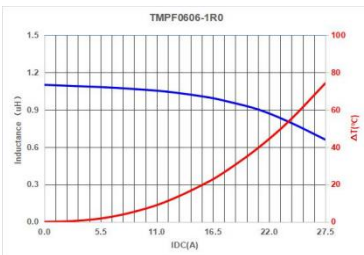


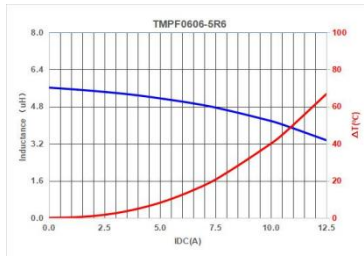
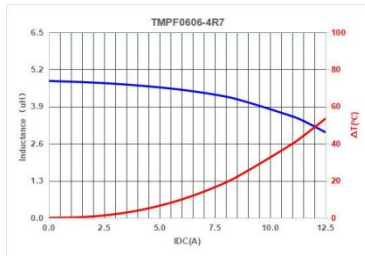
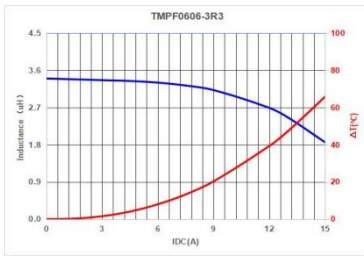


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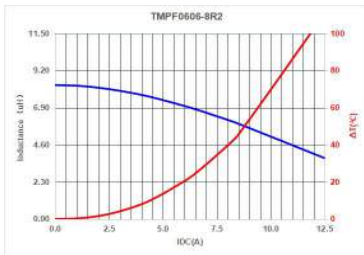
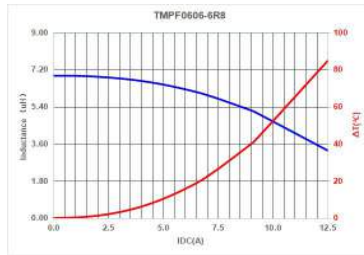
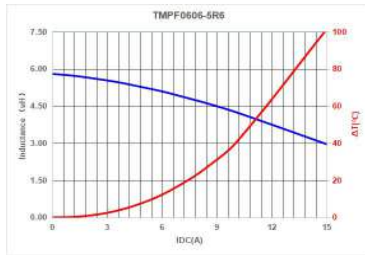
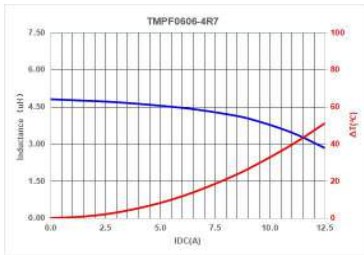
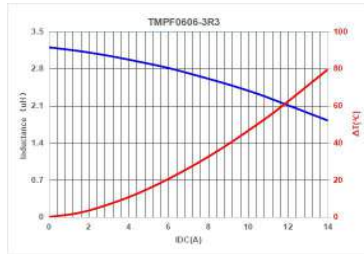
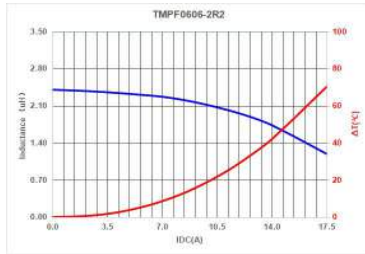
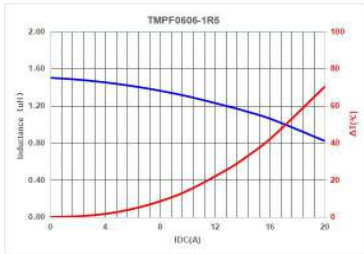
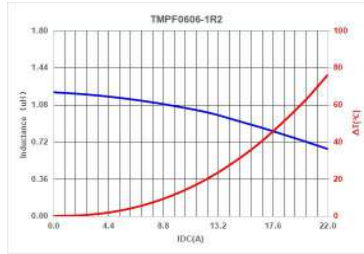
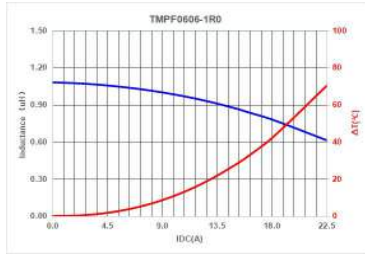
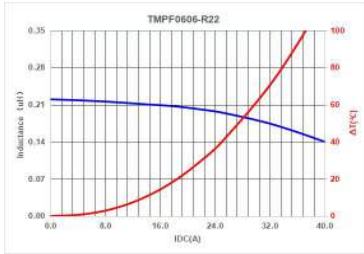


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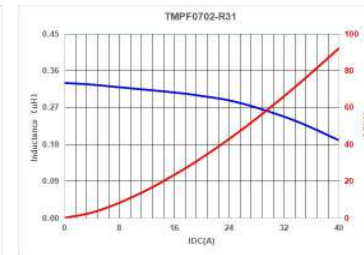
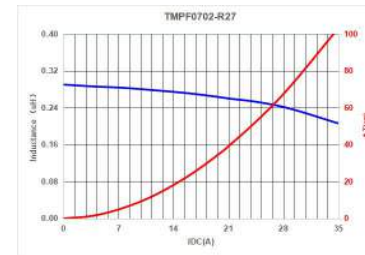
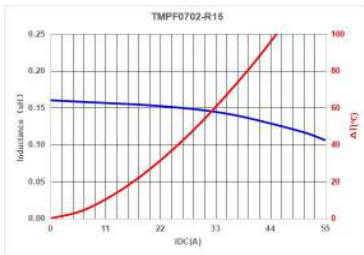




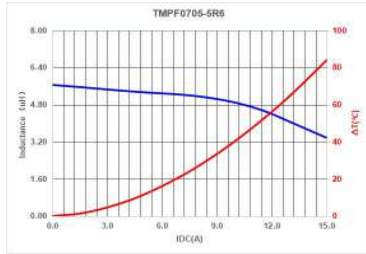
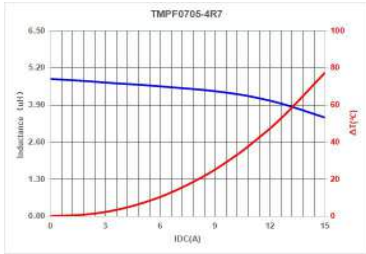
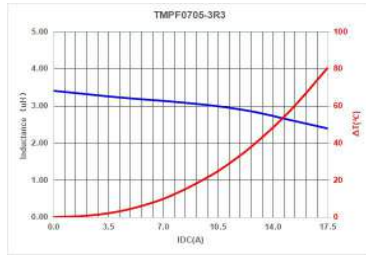
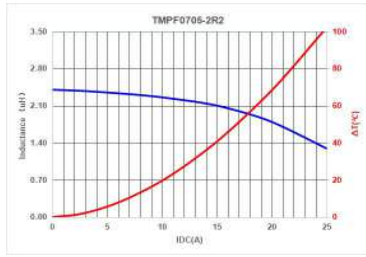
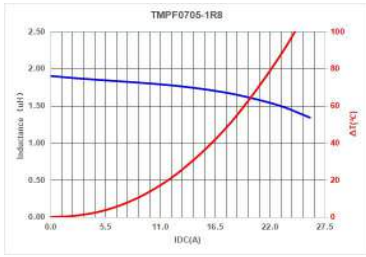
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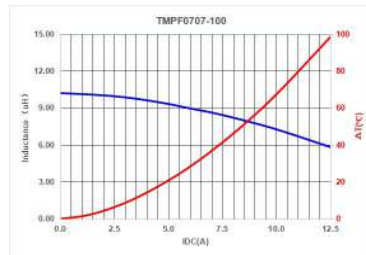
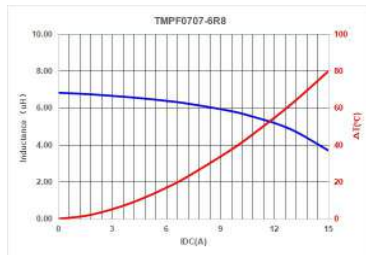
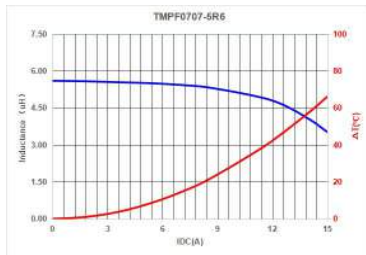
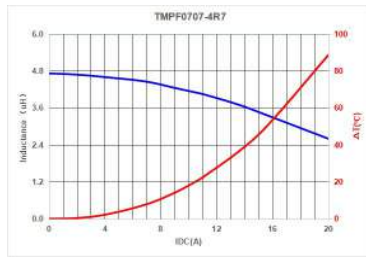
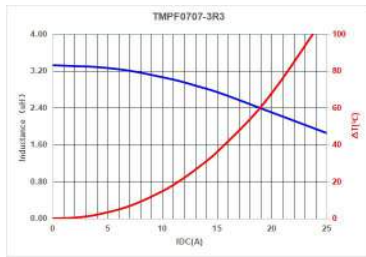
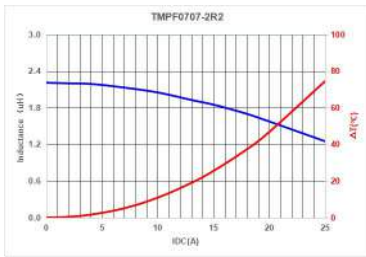
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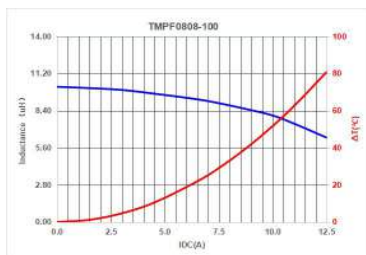
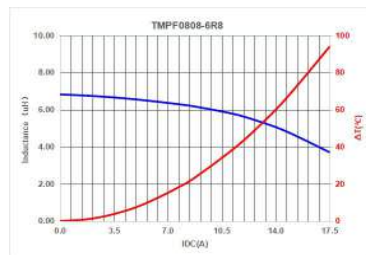
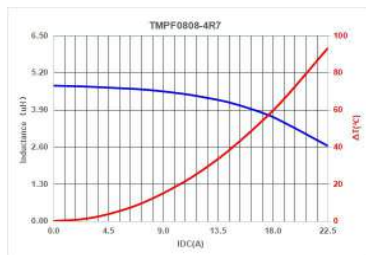
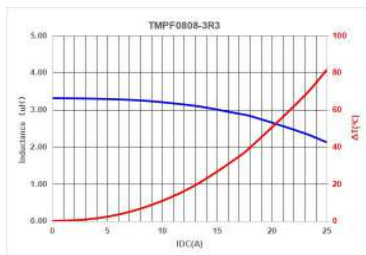
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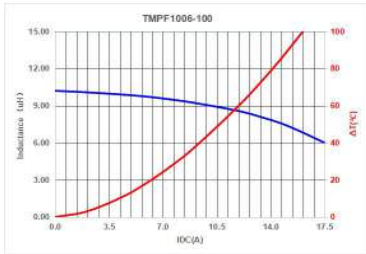
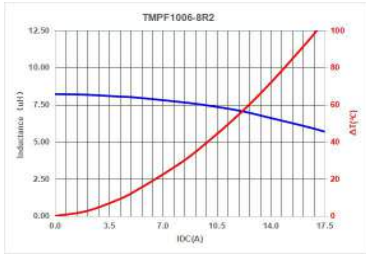
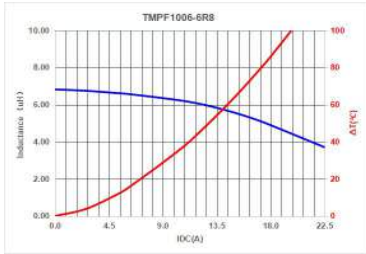
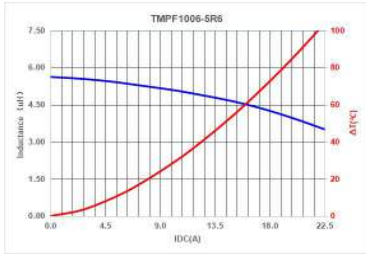
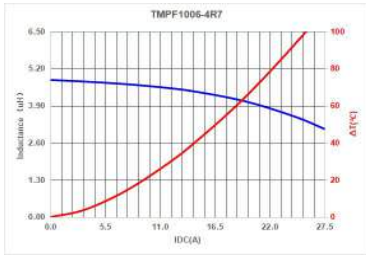
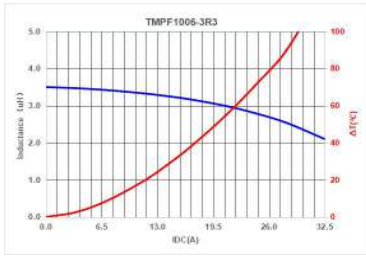
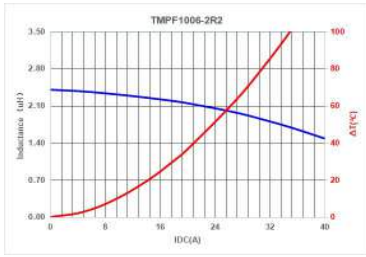
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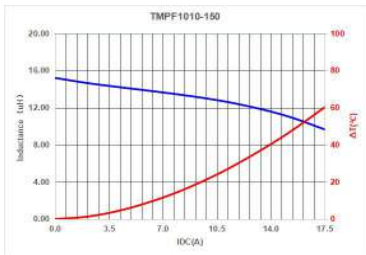
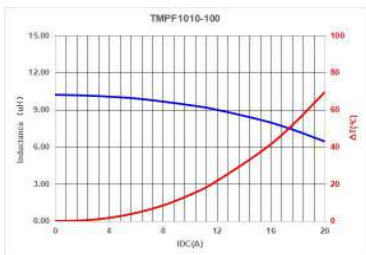
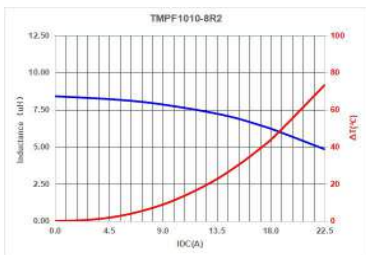
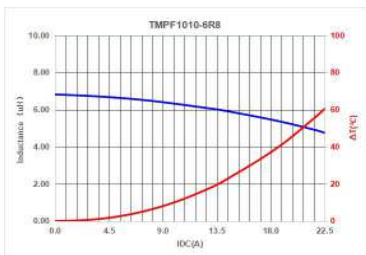
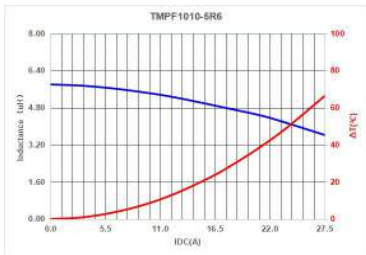
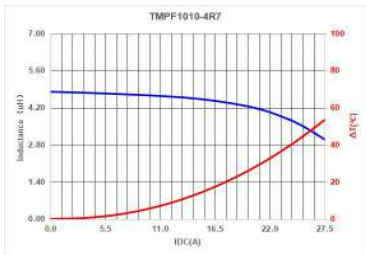
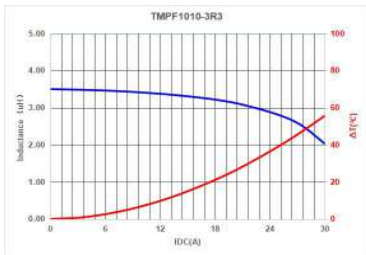
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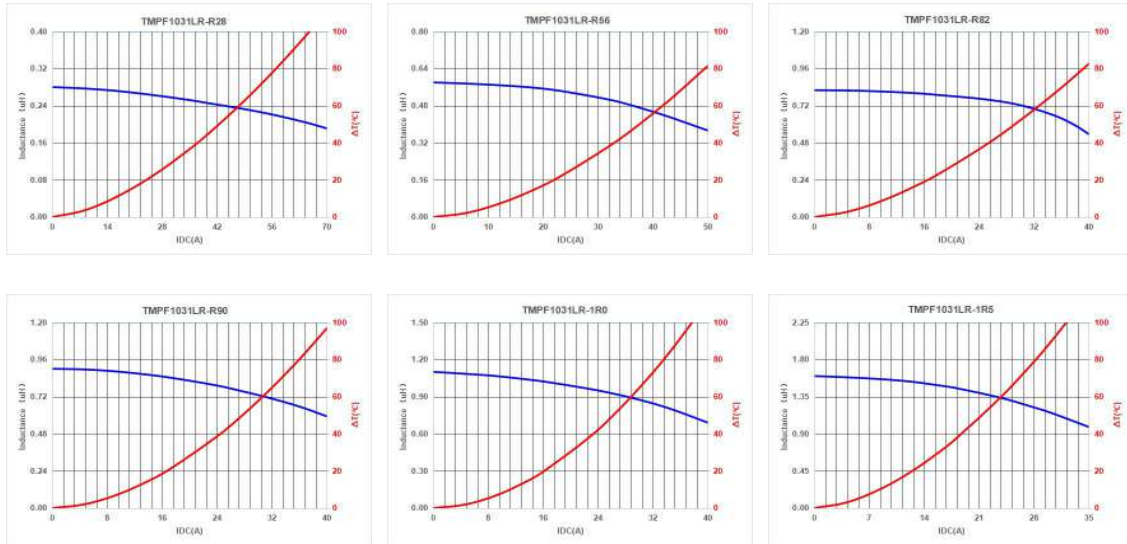
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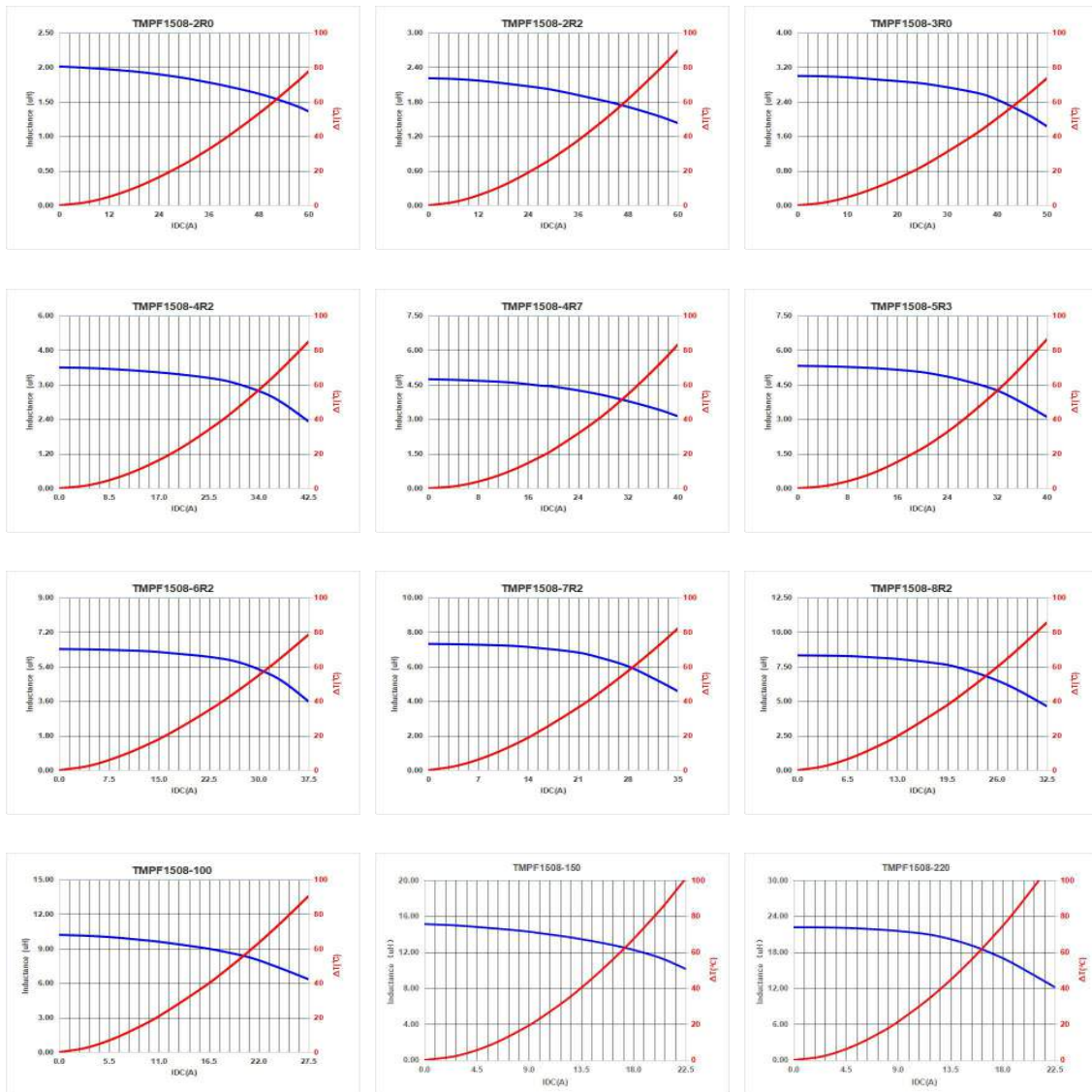
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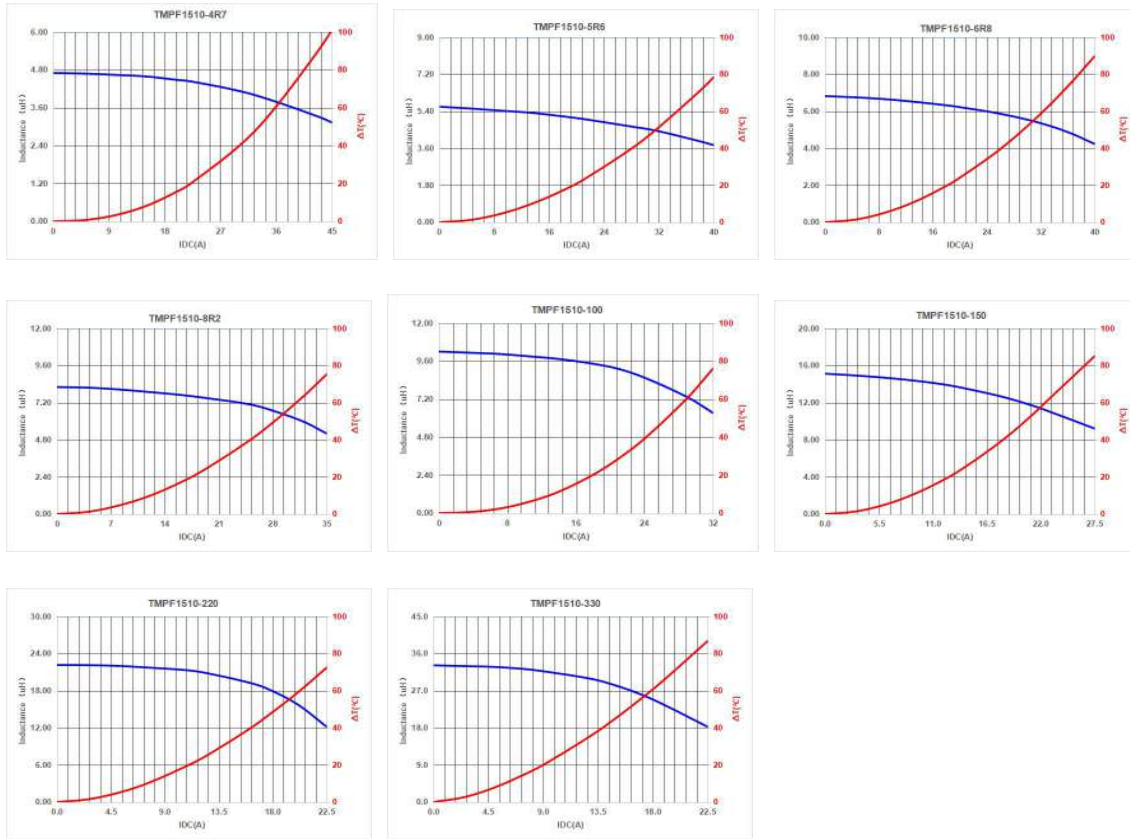
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