SMD Power Inductor

TMPV-Series(N)-D

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.

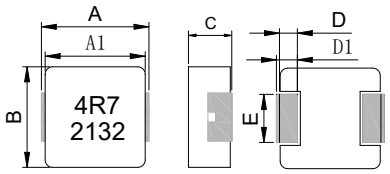
Halogen-free

RoHS

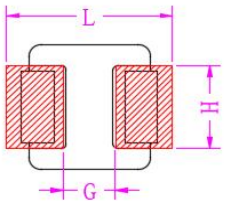
2. Applications

Automotive applications.

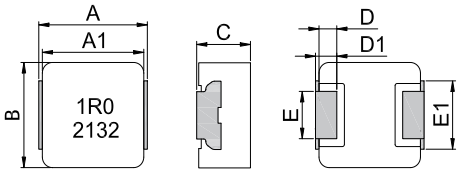
3. Dimensions



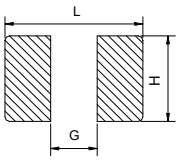
Recommend PC Board Pattern



Series	A(mm)	A1(mm)	B(mm)	C(mm)	D(mm)	D1(mm)	E(mm)	L(mm)	G(mm)	H(mm)
TMPV0503SPV	5.5±0.3	4.9±0.3	5.25±0.2	2.8±0.2	1.1±0.3	1.3±0.3	3.0±0.3	6.7 Ref	2.1 Ref	3.5 Ref
TMPV0504SPV	5.5±0.3	4.9±0.3	5.25±0.2	3.8±0.2	1.1±0.3	1.3±0.3	3.0±0.3	6.7 Ref	2.1 Ref	3.5 Ref



Recommend PC Board Pattern



Series	A(mm)	A1(mm)	B(mm)	C(mm)	D(mm)	D1(mm)	E(mm)	E1(mm)	L(mm)	G(mm)	H(mm)
TMPV0603SV	7.1±0.3	6.6±0.2	6.6±0.2	2.8±0.2	1.6±0.3	1.8±0.3	3.0±0.2	4.3±0.3	8.4 Ref	2.7 Ref	3.4 Ref
TMPV0754SV	7.9±0.3	7.3±0.2	7.3±0.2	5.2±0.2	1.7±0.3	2.0±0.3	3.0±0.2	5.4±0.2	9.0 Ref	3.0 Ref	3.5 Ref
TMPV1004SV	11.0±0.3	10.1±0.3	10.0±0.3	3.8±0.2	2.0±0.3	2.3±0.3	4.5±0.3	6.6±0.3	12.3 Ref	5.5 Ref	5.0 Ref
TMPV1054SV	11.0±0.3	10.1±0.3	10.0±0.3	5.1±0.3	2.0±0.3	2.3±0.3	4.5±0.3	6.6±0.3	12.3 Ref	5.5 Ref	5.0 Ref
TMPV1006SV	11.0±0.3	10.1±0.3	10.0±0.3	5.8±0.2	2.0±0.3	2.3±0.3	4.5±0.3	6.6±0.3	12.3 Ref	5.5 Ref	5.0 Ref
TMPV1265SPV	13.6±0.4	12.6±0.3	12.6±0.2	6.2±0.3	2.0±0.3	2.5±0.3	5.0±0.3	9.2±0.3	15.0 Ref	8.0 Ref	6.0 Ref

4. Part Numbering

TMPV	0503	SPV	-	4R7	M	-	N	-	D
A	B	C		D	E		F		G

A: Series	
B: Dimension	BxC
C: Type	Standard.
D: Inductance	4R7=4.70uH
E: Inductance Tolerance	K=±10%，L=±15%，M=±20%，N=±25%，Y=±30%
F、G: Code	Marking direction cannot decide polarity.
	Marking: Black.4R7and 2132(21:YY,32:WW, follow production date).

5. Specification

Part Number	Inductance L0 A(uH) ±20%	Irms(A)		I sat (A)		DCR (mΩ) Typ	DCR (mΩ) Max
		Typ	Max	Typ	Max		
TMPV0503SPV-R10MN-D	0.10	20.0	17.0	33.0	30.0	1.5	1.8
TMPV0503SPV-R33MN-D	0.33	17.0	15.0	15.0	13.0	3.9	4.7
TMPV0503SPV-R36MN-D	0.36	16.0	14.0	14.5	12.5	4.3	5.2
TMPV0503SPV-R68MN-D	0.68	12.0	11.0	11.7	10.0	8.5	9.7
TMPV0503SPV-1R0MN-D	1.00	10.5	9.5	8.0	6.7	10.0	11.5
TMPV0503SPV-1R5MN-D	1.50	8.5	7.6	6.5	5.7	15.4	17.7
TMPV0503SPV-2R2MN-D	2.20	7.5	6.6	5.8	4.8	20.0	23.0
TMPV0503SPV-3R3MN-D	3.30	6.0	5.5	5.4	4.5	31.0	36.0
TMPV0503SPV-4R7MN-D	4.70	5.2	4.4	4.5	4.0	49.0	57.0
TMPV0503SPV-5R6MN-D	5.60	4.4	3.8	4.3	3.8	61.0	71.0
TMPV0503SPV-6R8MN-D	6.80	4.0	3.5	4.0	3.5	72.0	83.0
TMPV0503SPV-100MN-D	10.0	3.0	2.5	2.4	2.0	97.0	111.0
TMPV0503SPV-150MN-D	15.0	2.5	2.0	2.2	1.9	165.0	190.0
TMPV0503SPV-220MN-D	22.0	2.2	1.8	2.0	1.7	205.0	235.0

Part Number	Inductance L0 A(uH) ±20%	Irms(A)		I sat (A)		DCR (mΩ) Typ	DCR (mΩ) Max
		Typ	Max	Typ	Max		
TMPV0504SPV-R47MN-D	0.47	13.5	12.5	16.3	14.8	5.5	6.3
TMPV0504SPV-R68MN-D	0.68	12.5	11.5	15.2	13.7	7.5	8.6
TMPV0504SPV-1R0MN-D	1.0	11.5	10.5	13.0	11.5	9.8	11.3
TMPV0504SPV-1R5MN-D	1.5	9.0	8.0	12.0	10.5	14.7	16.2
TMPV0504SPV-2R2MN-D	2.2	7.8	7.0	11.0	9.5	21.8	24.0
TMPV0504SPV-3R3MN-D	3.3	6.8	6.2	9.0	8.0	30.0	34.5
TMPV0504SPV-4R7MN-D	4.7	6.1	5.7	8.1	7.2	35.6	39.2
TMPV0504SPV-6R8MN-D	6.8	5.2	4.7	6.3	5.4	50.0	57.5
TMPV0504SPV-100MN-D	10.0	4.0	3.6	5.2	4.6	82.0	92.0
TMPV0504SPV-150MN-D	15.0	3.0	2.8	3.8	3.2	100.0	120.0
TMPV0504SPV-220MN-D	22.0	2.7	2.4	3.5	3.0	170.0	187.0

Part Number	Inductance L0 A(uH) ±20%	I rms (A)		I sat (A)		DCR (mΩ)Typ	DCR (mΩ)Max
		Typ	Max	Typ	Max		
TMPV0603SV-R47MN-D	0.47	19.0	17.0	19.0	17.0	3.4	3.74
TMPV0603SV-1R0MN-D	1.00	14.0	12.5	14.0	12.5	6.0	6.6
TMPV0603SV-1R5MN-D	1.50	11.5	10.0	13.0	12.0	10.6	11.7
TMPV0603SV-2R2MN-D	2.20	9.0	8.0	10.5	9.5	15.0	16.5
TMPV0603SV-3R3MN-D	3.30	7.8	6.6	9.5	8.1	22.0	24.2
TMPV0603SV-4R7MN-D	4.70	6.4	5.5	7.2	6.2	29.0	32.0
TMPV0603SV-6R8MN-D	6.80	5.2	4.5	6.1	5.5	42.0	46.2
TMPV0603SV-8R2MN-D	8.20	4.8	4.0	5.6	4.5	49.0	54.0
TMPV0603SV-100MN-D	10.0	4.2	3.7	4.7	4.0	63.0	69.3
TMPV0603SV-150MN-D	15.0	3.7	3.2	4.0	3.2	100.0	110.0
TMPV0603SV-220MN-D	20.0	2.9	2.4	3.0	2.5	150.0	165.0

Part Number	Inductance L0 A(uH) ±20%	Irms(A)		I sat (A)		DCR (mΩ) Typ	DCR (mΩ) Max
		Typ	Max	Typ	Max		
TMPV0754SV-R47MN-D	0.47	24.0	21.0	26.0	23.0	2.2	2.7
TMPV0754SV-R56MN-D	0.56	23.0	20.0	25.0	22.0	2.6	3.1
TMPV0754SV-R68MN-D	0.68	22.0	19.0	24.0	21.0	3.1	3.7
TMPV0754SV-1R0MN-D	1.00	20.0	17.0	23.0	20.0	5.0	6.0
TMPV0754SV-1R5MN-D	1.50	17.0	15.0	19.0	17.0	6.3	7.3
TMPV0754SV-2R2MN-D	2.20	14.5	13.0	16.5	14.5	9.7	11.2
TMPV0754SV-3R3MN-D	3.30	11.5	10.5	14.0	12.3	13.0	15.0
TMPV0754SV-4R7MN-D	4.70	10.5	9.0	13.3	11.3	17.8	20.5
TMPV0754SV-5R6MN-D	5.60	9.3	8.5	11.0	9.5	19.2	22.1
TMPV0754SV-6R8MN-D	6.80	8.7	8.0	10.2	9.0	23.0	26.5
TMPV0754SV-8R2MN-D	8.20	8.0	7.5	9.2	8.1	27.3	31.4
TMPV0754SV-100MN-D	10.0	7.2	6.7	8.0	7.0	33.0	38.0
TMPV0754SV-120MN-D	12.0	6.3	5.8	7.7	6.7	43.0	52.0
TMPV0754SV-150MN-D	15.0	5.5	5.0	7.2	6.2	60.0	66.0
TMPV0754SV-220MN-D	22.0	5.0	4.5	6.3	5.4	85.0	93.5
TMPV0754SV-330MN-D	33.0	4.0	3.5	4.9	4.2	111.0	127.6
TMPV0754SV-470MN-D	47.0	3.2	2.7	4.1	3.5	156.0	171.6
TMPV0754SV-560MN-D	56.0	3.0	2.6	3.4	2.9	188.0	206.8
TMPV0754SV-680MN-D	68.0	2.7	2.4	3.0	2.6	218.0	251.0
TMPV0754SV-101MN-D	100.0	2.2	2.0	2.0	1.6	310.0	357.0

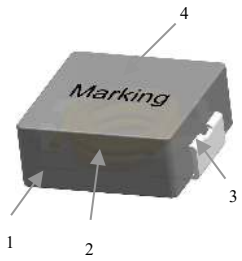
Part Number	Inductance L0 A(uH) ±20%	I rms (A)		I sat (A)		DCR (mΩ)Typ	DCR (mΩ)Max
		Typ	Max	Typ	Max		
TMPV1004SV-R47MN-D	0.47	34.0	29.0	31.0	28.0	1.42	1.63
TMPV1004SV-R56MN-D	0.56	32.0	27.0	29.0	27.0	1.7	2.0
TMPV1004SV-R68MN-D	0.68	31.0	26.0	28.0	26.0	2.0	2.3
TMPV1004SV-R82MN-D	0.82	27.0	23.0	26.5	24.0	2.4	2.7
TMPV1004SV-R78MN-D	0.78	30.0	25.0	27.0	25.0	2.3	2.5
TMPV1004SV-1R0MN-D	1.00	25.0	21.0	26.0	23.0	2.7	3.1
TMPV1004SV-1R2MN-D	1.20	23.0	20.0	25.0	22.0	3.2	3.7
TMPV1004SV-1R5MN-D	1.50	22.0	19.0	24.0	21.0	3.9	4.5
TMPV1004SV-1R8MN-D	1.80	20.0	17.0	23.0	20.0	4.4	5.5
TMPV1004SV-2R2MN-D	2.20	18.0	16.0	19.0	17.0	5.3	6.1
TMPV1004SV-3R3MN-D	3.30	15.0	13.0	17.0	15.0	9.0	10.4
TMPV1004SV-4R7MN-D	4.70	11.0	10.0	13.5	11.5	13.4	15.0
TMPV1004SV-5R6MN-D	5.60	10.5	9.5	12.0	10.5	15.4	17.0
TMPV1004SV-6R8MN-D	6.80	10.0	9.5	11.0	10.0	17.0	19.0
TMPV1004SV-8R2MN-D	8.20	8.5	7.7	9.0	8.0	23.0	25.3
TMPV1004SV-100MN-D	10.0	8.0	7.2	8.2	7.5	27.0	30.0
TMPV1004SV-120MN-D	12.0	7.4	6.8	7.5	6.9	29.0	33.4
TMPV1004SV-150MN-D	15.0	6.4	6.0	7.0	6.3	40.0	45.0
TMPV1004SV-220MN-D	22.0	5.5	5.0	6.0	5.5	59.0	68.0
TMPV1004SV-330MN-D	33.0	4.7	3.7	4.8	4.1	89.0	102.0
TMPV1004SV-470MN-D	47.0	3.6	3.2	4.0	3.6	143.0	165.0

Part Number	Inductance L0 A(uH) ±20%	I rms (A)		I sat (A)		DCR (mΩ)Typ	DCR (mΩ)Max
		Typ	Max	Typ	Max		
TMPV1054SV-R33MN-D	0.33	41.0	36.0	60.0	55.0	1.0	1.2
TMPV1054SV-R36MN-D	0.36	40.0	35.0	55.0	50.0	1.1	1.32
TMPV1054SV-R47MN-D	0.47	36.0	32.0	50.0	44.0	1.4	1.68
TMPV1054SV-R56MN-D	0.56	34.0	30.0	48.0	42.0	1.6	1.92
TMPV1054SV-R68MN-D	0.68	32.0	28.8	46.0	40.0	1.85	2.22
TMPV1054SV-1R0MN-D	1.00	30.0	27.0	37.0	31.7	2.3	2.76
TMPV1054SV-1R2MN-D	1.20	27.0	24.0	29.0	26.0	3.0	3.6
TMPV1054SV-1R5MN-D	1.50	25.0	23.0	28.0	25.0	3.6	4.3
TMPV1054SV-1R8MN-D	1.80	24.0	22.0	26.0	22.5	3.9	4.6
TMPV1054SV-2R2MN-D	2.20	23.0	20.7	25.0	21.4	4.1	4.9
TMPV1054SV-3R3MN-D	3.30	18.7	16.8	20.0	17.5	6.2	7.2
TMPV1054SV-4R7MN-D	4.70	14.5	13.0	17.0	14.5	9.0	10.0
TMPV1054SV-5R6MN-D	5.60	13.2	12.0	16.2	14.0	10.2	11.7
TMPV1054SV-6R8MN-D	6.80	12.3	11.0	15.3	13.5	12.4	14.0
TMPV1054SV-8R2MN-D	8.20	10.3	9.2	14.0	12.0	17.8	20.5
TMPV1054SV-100MN-D	10.0	9.0	7.8	13.0	11.0	20.0	23.0
TMPV1054SV-120MN-D	12.0	8.3	7.3	9.8	8.5	23.0	26.4
TMPV1054SV-150MN-D	15.0	7.6	6.8	9.2	7.9	26.3	30.3
TMPV1054SV-180MN-D	18.0	7.0	6.1	9.0	7.7	33.0	38.0
TMPV1054SV-220MN-D	22.0	6.0	5.4	8.4	7.0	43.0	49.5
TMPV1054SV-330MN-D	33.0	5.0	4.3	7.6	6.5	66.0	75.3
TMPV1054SV-470MN-D	47.0	4.2	3.7	5.5	4.8	89.0	103.0
TMPV1054SV-680MN-D	68.0	3.5	3.1	4.8	3.8	130.0	150.0
TMPV1054SV-820MN-D	82.0	3.2	2.8	4.3	3.5	165.0	190.0
TMPV1054SV-101MN-D	100.0	2.7	2.4	4.0	3.2	233.0	268.0

Part Number	Inductance L0 A(uH) ±20%	Irms(A)		I sat (A)		DCR (mΩ) Typ	DCR (mΩ) Max
		Typ	Max	Typ	Max		
TMPV1006SPV-100MN-D	10.0	11.0	10.0	14.0	12.0	17.5	21.0
TMPV1006SPV-220MN-D	22.0	7.5	6.5	9.5	8.0	40.0	46.0
TMPV1006SPV-470MN-D	47.0	5.2	4.6	6.0	5.1	68.0	75.0

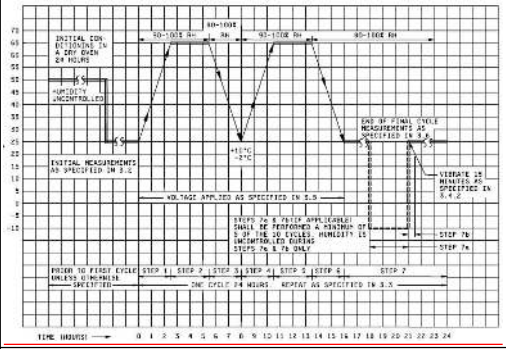
Part Number	Inductance L0 A(uH) ±20%	I rms (A)		I sat (A)		DCR (mΩ)Typ	DCR (mΩ)Max
		Typ	Max	Typ	Max		
TMPV1265SPV-R47MN-D	0.47	45.0	40.0	60.0	50.0	1.00	1.20
TMPV1265SPV-R68MN-D	0.68	36.5	30.0	36.5	31.0	1.35	1.62
TMPV1265SPV-1R0MN-D	1.00	32.0	27.0	32.0	28.0	1.75	2.10
TMPV1265SPV-1R5MN-D	1.50	27.0	24.0	29.0	26.0	2.30	2.76
TMPV1265SPV-2R2MN-D	2.20	23.0	20.0	26.0	23.0	3.6	4.2
TMPV1265SPV-3R3MN-D	3.30	19.0	16.0	24.0	21.0	5.9	6.8
TMPV1265SPV-4R7MN-D	4.70	17.0	14.0	20.0	18.0	7.3	8.4
TMPV1265SPV-5R6MN-D	5.60	15.0	13.0	18.0	16.0	9.1	10.0
TMPV1265SPV-6R8MN-D	6.80	14.0	12.0	17.0	15.0	9.7	11.2
TMPV1265SPV-8R2MN-D	8.20	13.0	11.0	16.0	14.0	11.8	13.6
TMPV1265SPV-100MN-D	10.0	12.0	10.0	13.5	12.0	14.3	16.5
TMPV1265SPV-150MN-D	15.0	9.0	8.0	10.0	9.0	23.6	27.2
TMPV1265SPV-220MN-D	22.0	7.5	6.5	8.0	7.0	34.1	39.2
TMPV1265SPV-330MN-D	33.0	6.3	5.5	7.2	6.3	53.0	61.0
TMPV1265SPV-470MN-D	47.0	5.2	4.3	6.0	5.1	74.1	89.0
TMPV1265SPV-680MN-D	68.0	4.5	4.0	5.5	4.7	92.0	110.0
TMPV1265SPV-820MN-D	82.0	4.0	3.5	5.2	4.5	115.0	138.0
TMPV1265SPV-101MN-D	100.0	3.8	3.3	4.5	4.0	120.0	144.0

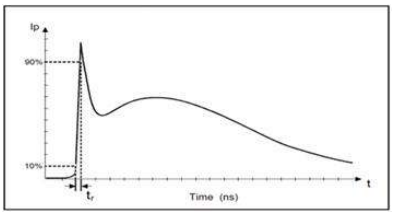
6. Material List

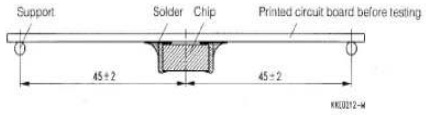
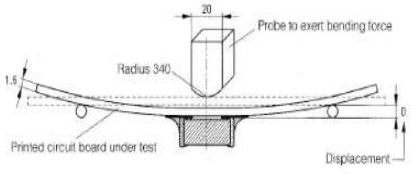
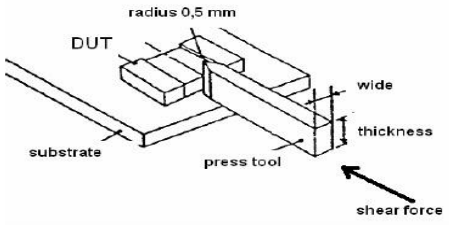


NO	Items	Materials
1	Core	Alloy Powder .
2	Wire	Polyester Wire or equivalent.
3	Clip	100% Pb free solder(Ni+Sn---Plating)
4	Ink	Halogen-free ketone

7. Reliability and Test Condition

<table>
<tr><th>Item</th><th>Performance</th><th>Test Condition</th></tr>
<tr><td>Operating temperature</td><td>-55~+165℃(Including self - temperature rise)</td><td>N/A</td></tr>
<tr><td>Storage temperature and Humidity range</td><td>1. Less than40℃,85%RH (Product with taping)
2. -55~+165℃(on board)</td><td>N/A</td></tr>
<tr><td colspan="3">Electrical Performance Test</td></tr>
<tr><td>Inductance</td><td rowspan="2">Refer to standard electrical characteristics list.</td><td>Agilent 4284A,E4991A,KEYSIGHT E4980A/AL,chroma 3302,3205</td></tr>
<tr><td>DCR</td><td>Agilent 4339B,chrom16502</td></tr>
<tr><td>Saturation Current (Isat)</td><td>Approximately △L30%</td><td>Saturation DC Current (Isat) will cause L0
to drop △L(%)</td></tr>
<tr><td>Heat Rated Current (Irms)</td><td>Approximately △T40℃</td><td>Heat Rated Current (Irms) will cause the coil temperature rise △T(℃).
1.Applied the allowed DC current
2.Temperature measured by digital surface thermometer</td></tr>
<tr><td colspan="3">Reliability Test</td></tr>
<tr><td>High Temperature Exposure(Storage)
AEC-Q200</td><td rowspan="5">Appearance：No damage.
Inductance：within±10% of initial value
Q：Shall not exceed the specification value.
RDC：within ±15% of initial value and shall not exceed the specification value</td><td>Preconditioning: Run through IR reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles
Temperature：165±2℃(Inductor)
Duration ： 1000hrs Min.
Measured at room temperature after placing for 24±2 hrs</td></tr>
<tr><td>Temperature Cycling
AEC-Q200</td><td>Preconditioning: Run through IR reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles
Condition for 1 cycle
Step1：-55±2℃ 30min Min.(Inductor)
Step2：165±2℃ transition time 1min MAX.
Step3：165±2℃ 30min Min.
Step4：Low temp. transition time 1min MAX.
Number of cycles： 1000
Measured at room temperature after placing for 24±2 hrs</td></tr>
<tr><td>Moisture Resistance
(AEC-Q200)</td><td>t=24 hours/cycle. Note:Steps 7a & 7b Unpowered.
  </td></tr>
<tr><td>Biased Humidity
(AEC-Q200)</td><td>Preconditioning: Run through IR reflow for 3 times.
(IPC/JEDEC J-STD-020E Classification Reflow Profiles)
Humidity ： 85±3％R.H,
Temperature：85℃±2℃
Duration : 1000hrs Min
Measured at room temperature after placing for24±2hrs</td></tr>
<tr><td>High Temperature Operational Life
(AEC-Q200)</td><td>Preconditioning: Run through IR reflow for 3 times.
(IPC/JEDECJ-STD-020E Classification Reflow Profiles
Temperature：165±2℃(Inductor)
Duration ： 1000hrs Min. With 100% rated current.
Measured at room temperature after placing for24±2hrs</td></tr>
<tr><td>External Visual</td><td>Appearance：No damage.</td><td>Inspect device construction, marking and workmanship. Electrical Test not required.</td></tr>
<tr><td>Physical Dimension</td><td>According to the product specification size measurement</td><td>According to the product specification size measurement</td></tr>
<tr><td>Resistance to Solvents</td><td>Appearance：No damage.</td><td>Add aqueous wash chemical - OKEM clean or equivalent.</td></tr>
<tr><td>Mechanical Shock</td><td>Appearance：No damage.
Inductance：within±10% of initial value
Q：Shall not exceed the specification value.
RDC：within ±15% of initial value and shall not exceed the specification value</td><td>Preconditioning: Run through IR reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles)
Test condition
<table>
<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>
<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>
</table>
3 shocks in each direction along 3 perpendicular axes(18 shocks).</td></tr>
</table>

<table>
<tr><th>Item</th><th>Performance</th><th>Test Condition</th></tr>
<tr><td>Vibration</td><td rowspan="3">Appearance：No damage.
Inductance：within±10% of initial value
Q：Shall not exceed the specification value.
RDC：within ±15% of initial value and shall not exceed the specification value</td><td>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)。</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>Test condition:(MIL-STD-202 Condition B)
Number of heat cycles:1
<table><tr><th>Temperature(℃)</th><th>Time(s)</th><th>Temperature ramp/immersion and emersion rate</th></tr><tr><td>260±5 (solder temp)</td><td>10±5</td><td>25mm/s±6 mm/s</td></tr></table>Depth: completely cover the termination</td></tr>
<tr><td>Thermal shock
(AEC-Q200)</td><td>Preconditioning: Run through IR reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles
Condition for 1 cycle
Step1：-55±2℃ 15±1min(Inductor)
Step2：165±2℃ within 20Sec.
Step3：165±2℃ 15±1min
Number of cycles： 300
Measured at room fempraturc after placing fo24±2hrs</td></tr>
<tr><td>ESD
HBM＞=2KV</td><td>Appearance：No damage.</td><td> 
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)</td></tr>
<tr><td>Solderability</td><td>More than 95% of the terminal electrode should be covered with solder。</td><td>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.</td></tr>
<tr><td>Electrical Characterization</td><td>Refer Specification for Approval</td><td>Summary to show Min, Max, Mean and Standard deviation .</td></tr>
<tr><td>Flammability</td><td>Electrical Test not required.</td><td>V-0 or V-1 are acceptable.</td></tr>
<tr><td>Board Flex</td><td>Appearance：No damage</td><td>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.
 
  </td></tr>
<tr><td>Terminal Strength(SMD)</td><td>Appearance：No damage</td><td>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.
  </td></tr>
</table>

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:

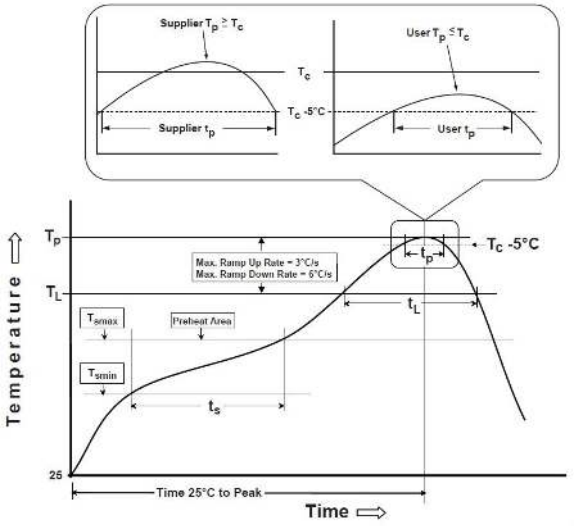
Recommended temperature profiles for lead free re-flow soldering in Figure 1. Table 1.1&1.2 (J-STD-020E)

(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)

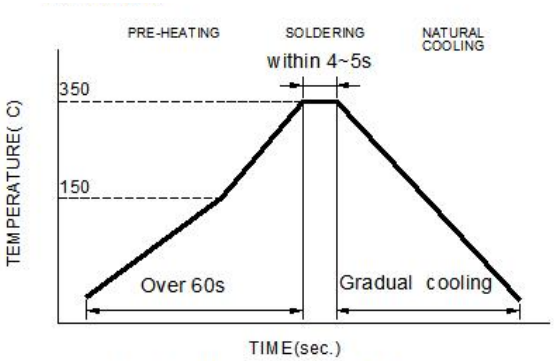
- Preheat circuit and products to 150℃
- Never contact the ceramic with the iron tip
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- 355℃ tip temperature (max)
- 1.0mm tip diameter (max)
- Limit soldering time to 4~5sec.

Fig.1 Soldering Reflow



Reflow times: 3 times max

Fig.2 Iron soldering temperature profiles



Iron Soldering times: 1 times max.

Soldering iron Method : 350± 5℃ max

Table (1.1): Reflow 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℃ 200℃ 60-120seconds
Ramp-up rate($T_L$to T_p)	3℃/second max.
Liquidus temperature(T_L) Time(t_L)maintained above T_L	217℃ 60-150 seconds
Classification temperature(T_c)	See Table (1.2)
Time(t_p) at Tc- 5℃ (Tp should be equal to or less than Tc.)	*< 30 seconds
Ramp-down rate(T_p to T_L)	6℃ /second max.
Time 25℃ to peak temperature	8 minutes max.

Tp: maximum peak package body temperature, **Tc**: the classification temperature.

For user (customer) **Tp** should be equal to or less than **Tc.**

* Tolerance for peak profile temperature (Tp) is defined as a supplier minimum and a user maximum.

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℃	260℃	260℃
	1.6-2.5mm	260℃	250℃	245℃
	≥2.5mm	250℃	245℃	245℃

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，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 disappearnc。

(9) The high power ultrasonic washing may damage the choke body。

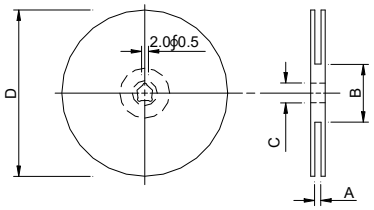
(10) Before use，the user should determine whether this product is suitable for their own design，Our company only guarantees that the product meets the requirements of this specification。

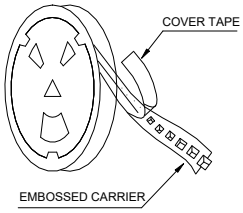
Application Notice

- Storage Conditions(component level)
  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 than40℃,85%RH.
  3. Recommended products should be used within 12 months form 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

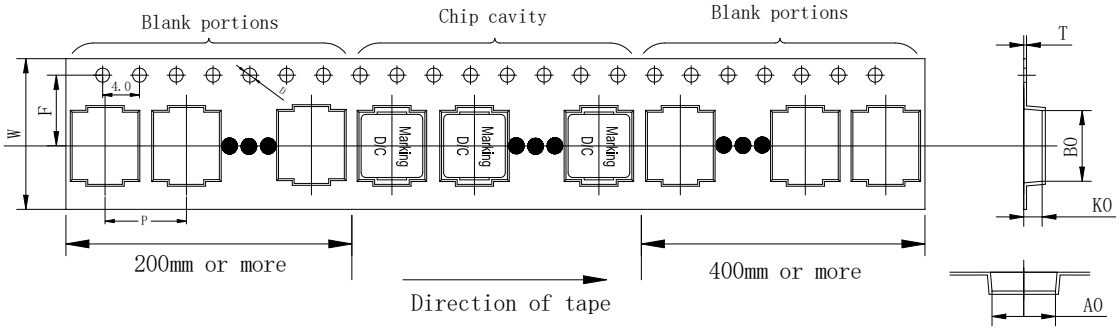
(1) Reel Dimension





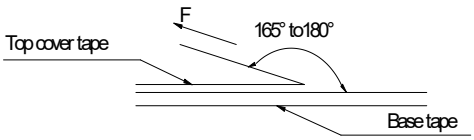
TMPV	Type	A(mm)	B(mm)	C(mm)	D(mm)
0503	13"x12mm	12.4+2/-0	100±2	13+0.5/-0.2	330
0504	13"x12mm	12.4+2/-0	100±2	13+0.5/-0.2	330
0603	13"x16mm	16.4+2/-0	100±2	13+0.5/-0.2	330
0754	13"x16mm	16.4+2/-0	100±2	13+0.5/-0.2	330
1004	13"x24mm	24.4+2/-0	100±2	13+0.5/-0.2	330
1054	13"x24mm	24.4+2/-0	100±2	13+0.5/-0.2	330
1006	13"x24mm	24.4+2/-0	100±2	13+0.5/-0.2	330
1265	13"x24mm	24.4+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
TMPV	0503SPV	6.2±0.1	5.5±0.1	3.3±0.1	8.0±0.1	12.0±0.3	5.5±0.1	0.35±0.05	1.5±0.1	2000PCS/R
TMPV	0504SPV	6.2±0.1	5.6±0.1	3.3±0.1	8.0±0.1	12.0±0.3	5.5±0.1	0.35±0.05	1.5+0.1	2000PCS/R
TMPV	0603SV	8.1±0.1	7.1±0.1	3.3±0.1	12.0±0.1	16.0±0.3	7.5±0.1	0.35±0.05	1.5±0.1	1000PCS/R
TMPV	0754SV	9.0±0.1	7.7±0.1	5.7±0.1	12.0±0.1	16.0±0.3	7.5±0.1	0.40±0.05	1.5±0.1	800PCS/R
TMPV	1004SV	12.3±0.1	10.4±0.1	4.5±0.1	16.0±0.1	24.0±0.3	11.5±0.1	0.40±0.05	1.5±0.1	500PCS/R
TMPV	1054SV	12.3±0.1	10.4±0.1	5.7±0.1	16.0±0.1	24.0±0.3	11.5±0.1	0.40±0.05	1.5±0.1	500PCS/R
TMPV	1006SV	12.3±0.1	10.4±0.1	6.5±0.1	16.0±0.1	24.0±0.3	11.5±0.1	0.40±0.05	1.5±0.1	500PCS/R
TMPV	1265SPV	14.8±0.1	13.0±0.1	7.0±0.1	16.0±0.1	24.0±0.3	11.5±0.1	0.50±0.05	1.5±0.1	500PCS/R

(3)Tearing Off Force

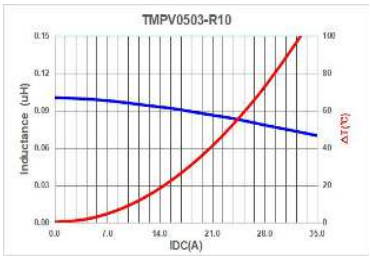


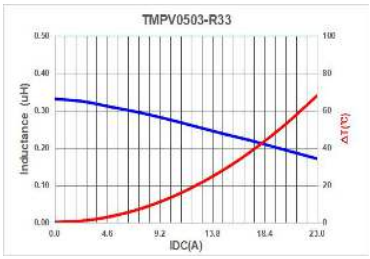
The force for tearing off cover tape is 10 to 130 grams in the arrow direction under the following conditions(referenced ANSI/EIA-481-D-2008 standard).

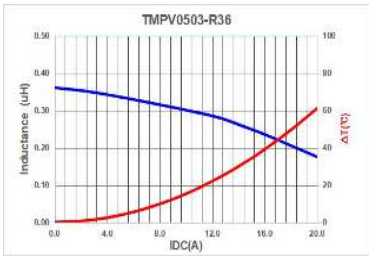
Tearing Speed mm	Room Temp. (℃)	Room Humidity (%)	Room atm (hPa)
300±10%	5~35	45~85	860~1060

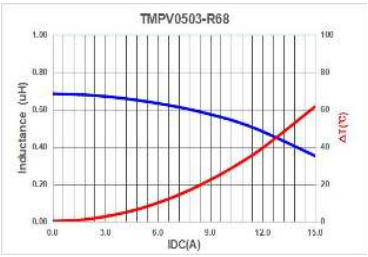
11. Typical Performance Curves

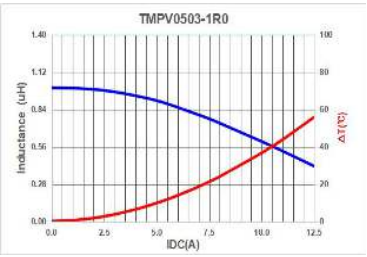
TMPV0503SPV

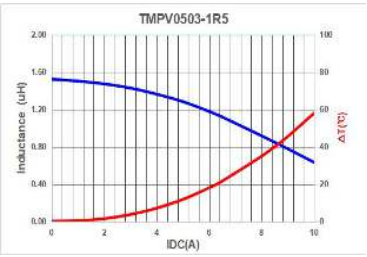


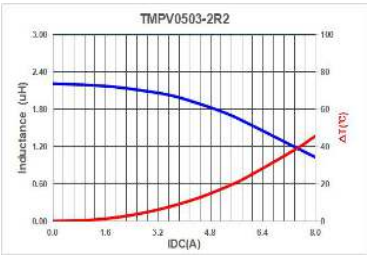


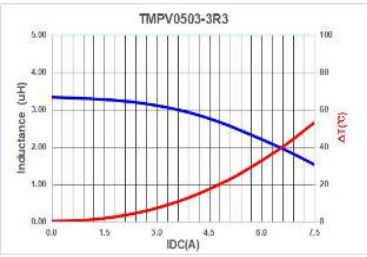


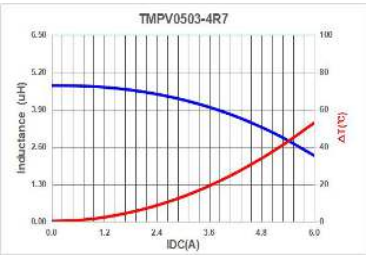


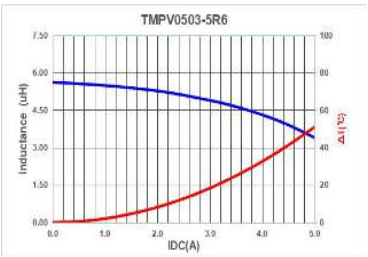


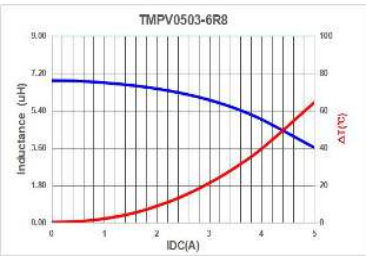


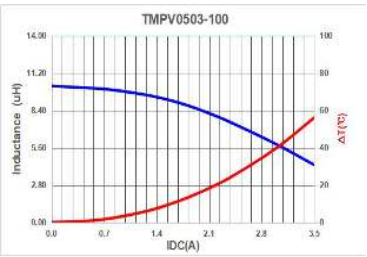


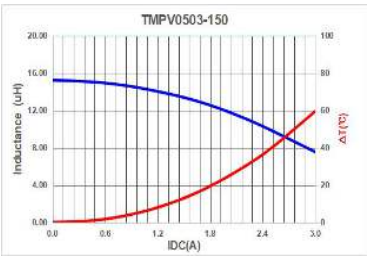


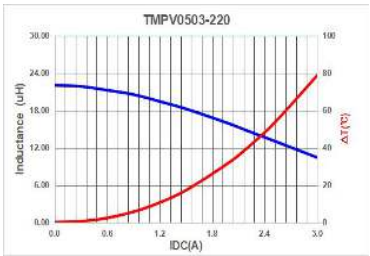




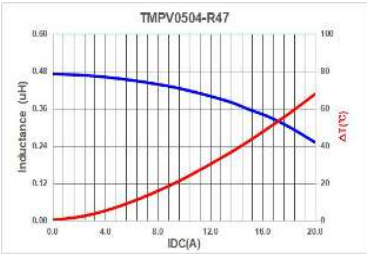


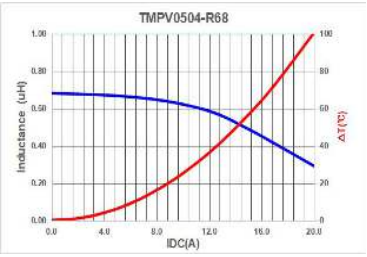


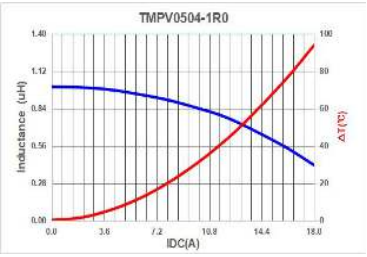


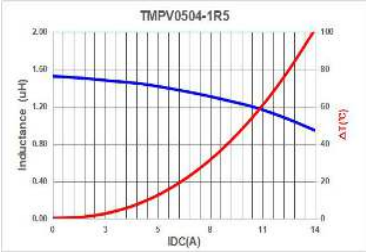


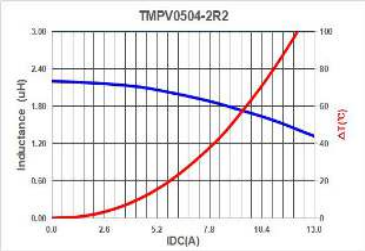
TMPV0504SPV

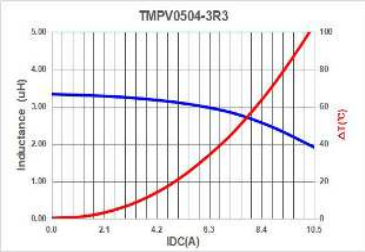


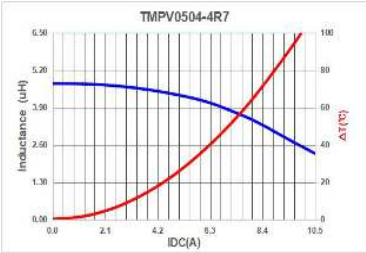


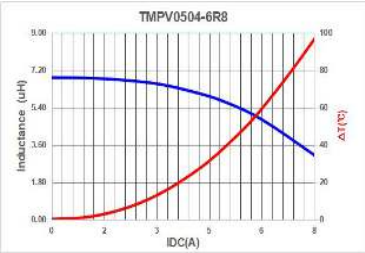


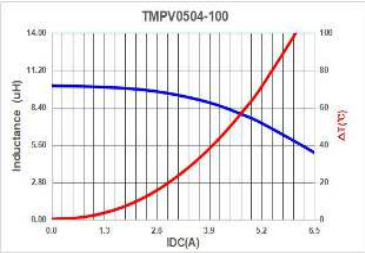

TMPV0504-1R5
Inductance (uH)
ΔT(℃)
IDC(A)

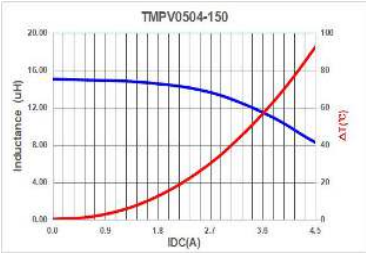

TMPV0504-2R2
Inductance (uH)
ΔT(℃)
IDC(A)

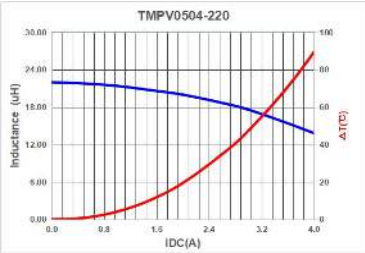

TMPV0504-3R3
Inductance (uH)
ΔT(℃)
IDC(A)


TMPV0504-4R7
Inductance (uH)
ΔT(℃)
IDC(A)

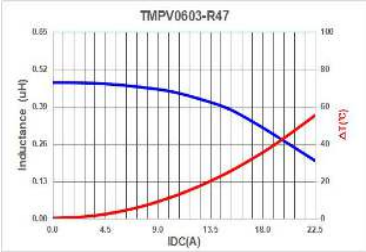

TMPV0504-6R8
Inductance (uH)
ΔT(℃)
IDC(A)

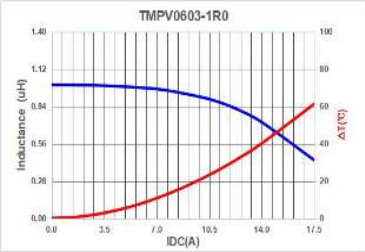

TMPV0504-100
Inductance (uH)
ΔT(℃)
IDC(A)

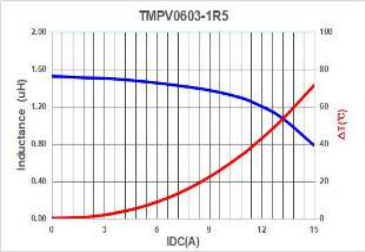

TMPV0504-150
Inductance (uH)
ΔT(℃)
IDC(A)

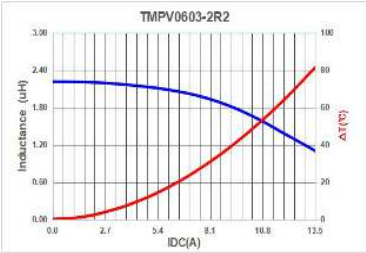

TMPV0504-220
Inductance (uH)
ΔT(℃)
IDC(A)

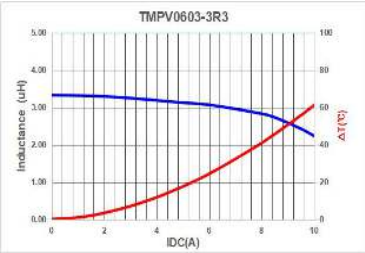
TMPV0603SV

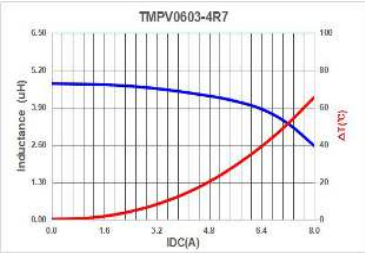

TMPV0603-R47
Inductance (uH)
ΔT(℃)
IDC(A)

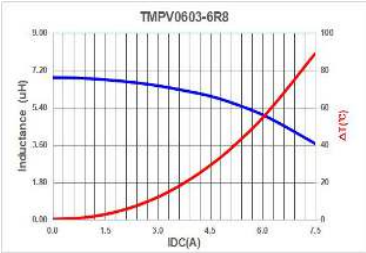

TMPV0603-1R0
Inductance (uH)
ΔT(℃)
IDC(A)

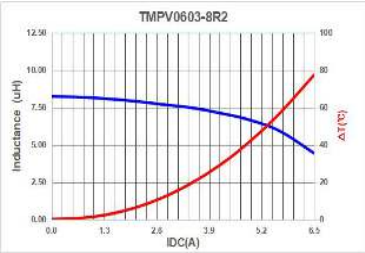

TMPV0603-1R5
Inductance (uH)
ΔT(℃)
IDC(A)

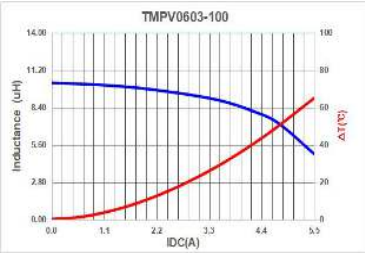

TMPV0603-2R2
Inductance (uH)
ΔT(℃)
IDC(A)

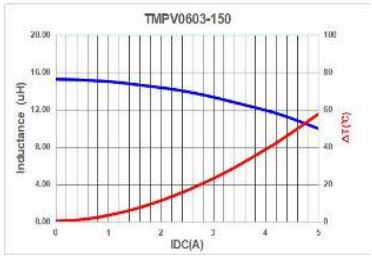

TMPV0603-3R3
Inductance (uH)
ΔT(℃)
IDC(A)

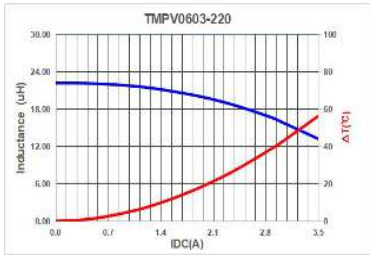

TMPV0603-4R7
Inductance (uH)
ΔT(℃)
IDC(A)


TMPV0603-6R8
Inductance (uH)
ΔT(℃)
IDC(A)

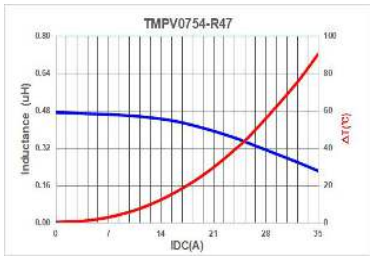

TMPV0603-8R2
Inductance (uH)
ΔT(℃)
IDC(A)

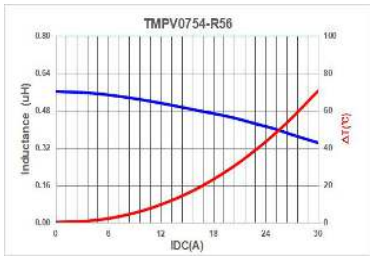

TMPV0603-100
Inductance (uH)
ΔT(℃)
IDC(A)

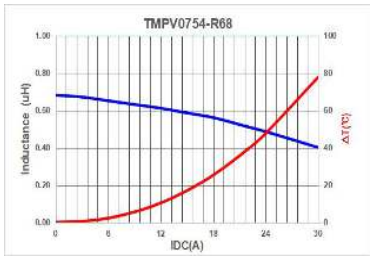

TMPV0603-150
Inductance (uH)
ΔT(℃)
IDC(A)

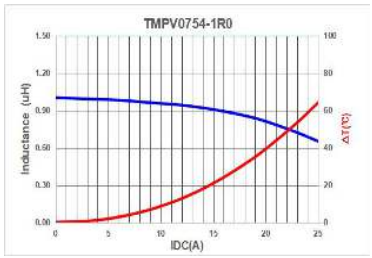

TMPV0603-220
Inductance (uH)
ΔT(℃)
IDC(A)

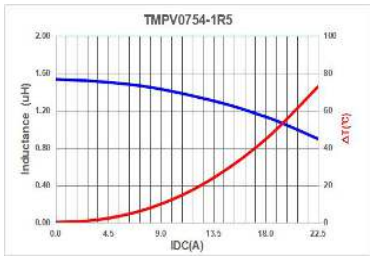
TMPV0754SV

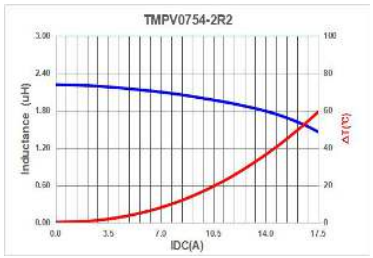

TMPV0754-R47
Inductance (uH)
ΔT(℃)
IDC(A)

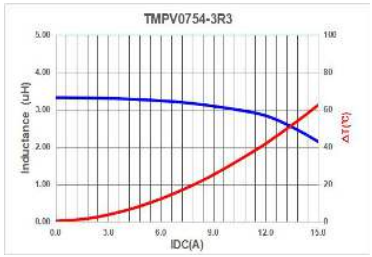

TMPV0754-R56
Inductance (uH)
ΔT(℃)
IDC(A)

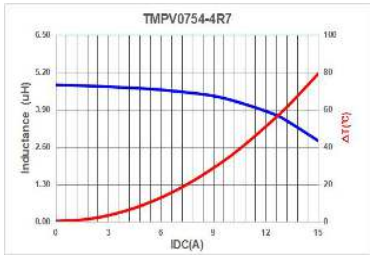

TMPV0754-R68
Inductance (uH)
ΔT(℃)
IDC(A)

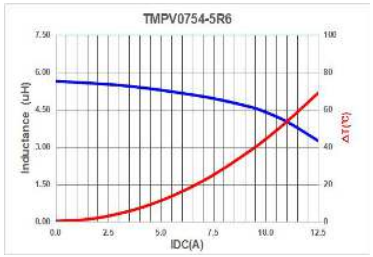

TMPV0754-1R0
Inductance (uH)
ΔT(℃)
IDC(A)

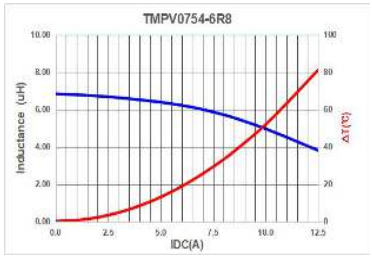

TMPV0754-1R5
Inductance (uH)
ΔT(℃)
IDC(A)

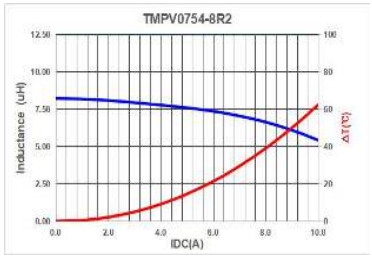

TMPV0754-2R2
Inductance (uH)
ΔT(℃)
IDC(A)

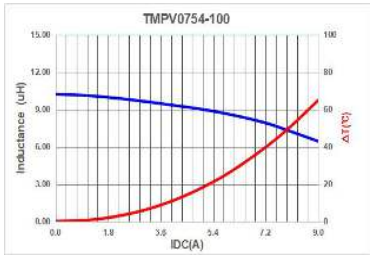

TMPV0754-3R3
Inductance (uH)
ΔT(℃)
IDC(A)

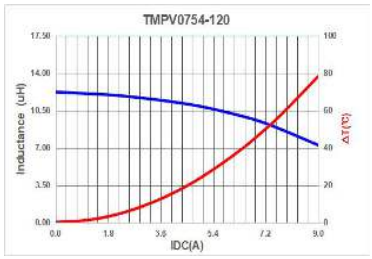

TMPV0754-4R7
Inductance (uH)
ΔT(℃)
IDC(A)

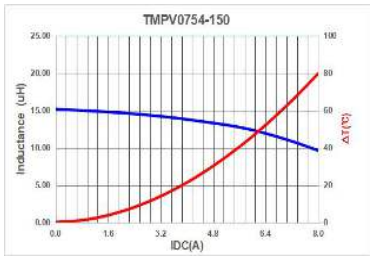

TMPV0754-5R6
Inductance (uH)
ΔT(℃)
IDC(A)

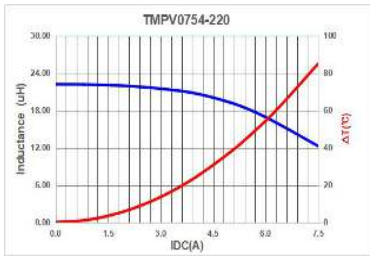

TMPV0754-6R8
Inductance (uH)
ΔT(℃)
IDC(A)

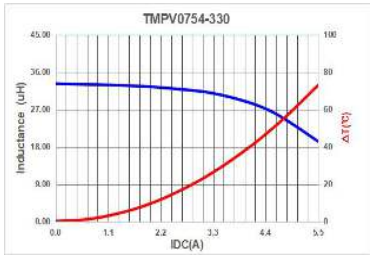

TMPV0754-8R2
Inductance (uH)
ΔT(℃)
IDC(A)

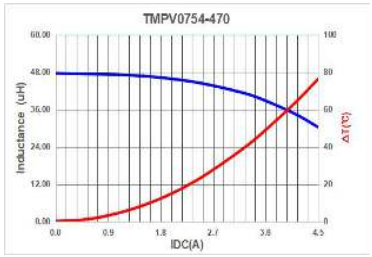

TMPV0754-100
Inductance (uH)
ΔT(℃)
IDC(A)

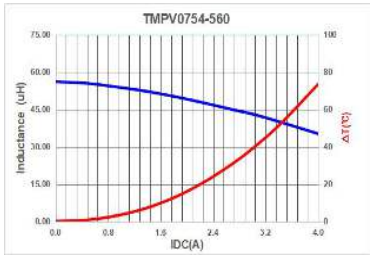

TMPV0754-120
Inductance (uH)
ΔT(℃)
IDC(A)

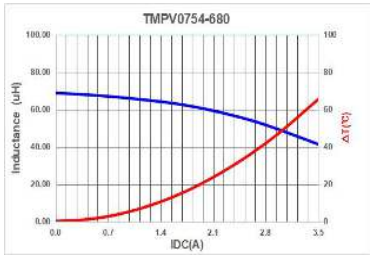

TMPV0754-150
Inductance (uH)
ΔT(℃)
IDC(A)

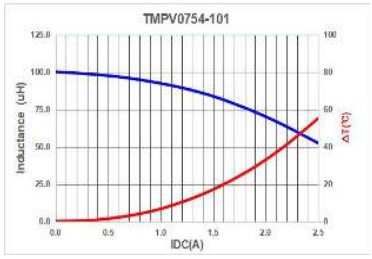

TMPV0754-220
Inductance (uH)
ΔT(℃)
IDC(A)


TMPV0754-330
Inductance (uH)
ΔT(℃)
IDC(A)

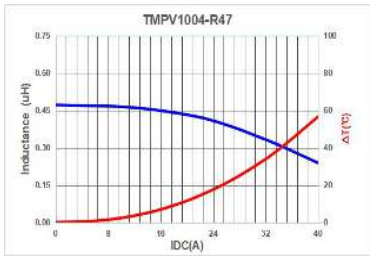

TMPV0754-470
Inductance (uH)
ΔT(℃)
IDC(A)

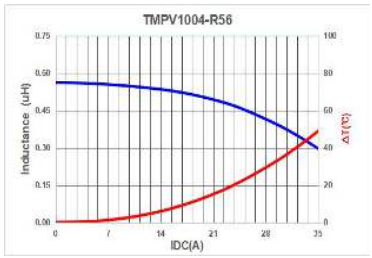

TMPV0754-560
Inductance (uH)
ΔT(℃)
IDC(A)

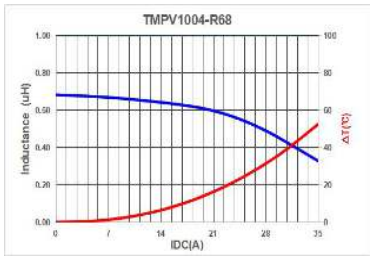

TMPV0754-680
Inductance (uH)
ΔT(℃)
IDC(A)

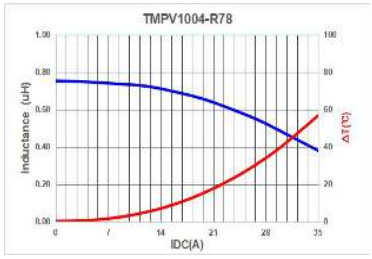

TMPV0754-101
Inductance (uH)
ΔT(℃)
IDC(A)

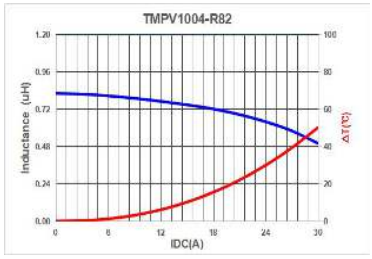
TMPV1004SV

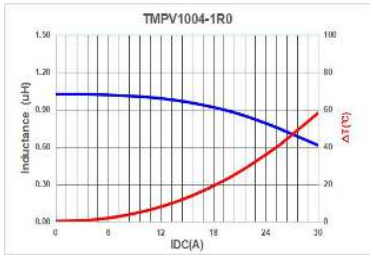

TMPV1004-R47
Inductance (uH)
ΔT(℃)
IDC(A)

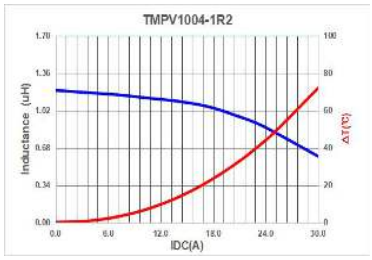

TMPV1004-R56
Inductance (uH)
ΔT(℃)
IDC(A)

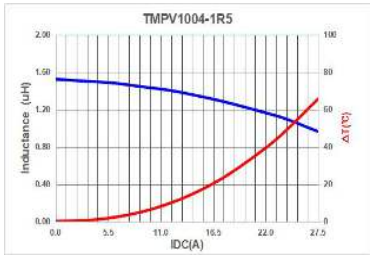

TMPV1004-R68
Inductance (uH)
ΔT(℃)
IDC(A)

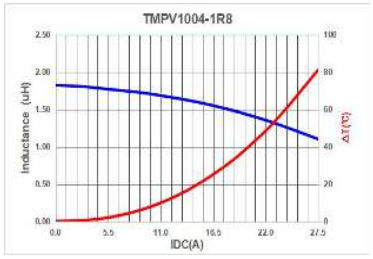

TMPV1004-R78
Inductance (uH)
ΔT(℃)
IDC(A)

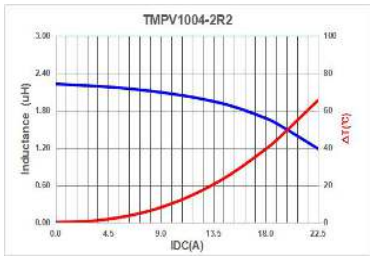

TMPV1004-R82
Inductance (uH)
ΔT(℃)
IDC(A)

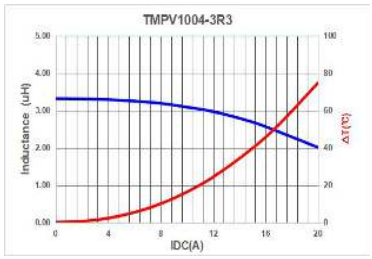

TMPV1004-1R0
Inductance (uH)
ΔT(℃)
IDC(A)

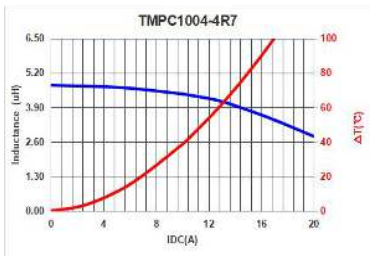

TMPV1004-1R2
Inductance (uH)
ΔT(℃)
IDC(A)

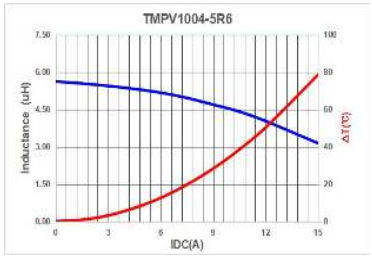

TMPV1004-1R5
Inductance (uH)
ΔT(℃)
IDC(A)

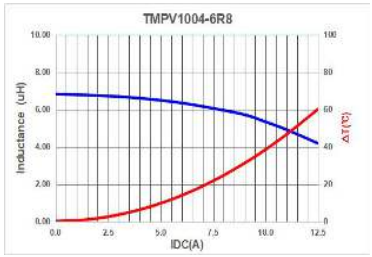

TMPV1004-1R8
Inductance (uH)
ΔT(℃)
IDC(A)

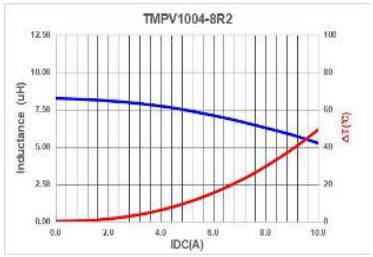

TMPV1004-2R2
Inductance (uH)
ΔT(℃)
IDC(A)

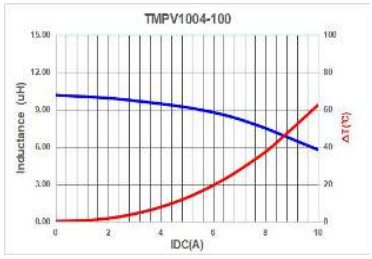

TMPV1004-3R3
Inductance (uH)
ΔT(℃)
IDC(A)

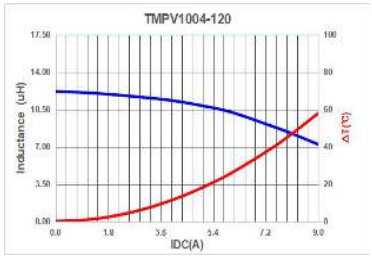

TMPC1004-4R7
Inductance (uH)
ΔT(℃)
IDC(A)

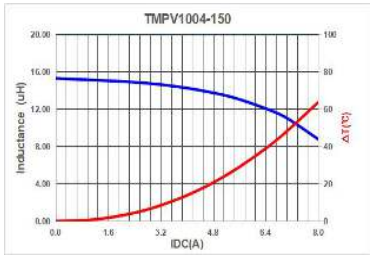

TMPV1004-5R6
Inductance (uH)
ΔT(℃)
IDC(A)

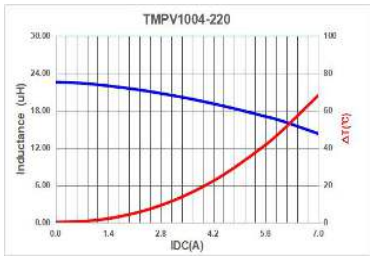

TMPV1004-6R8
Inductance (uH)
ΔT(℃)
IDC(A)

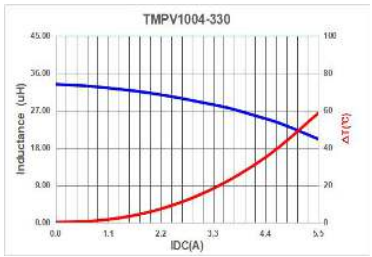

TMPV1004-8R2
Inductance (uH)
ΔT(℃)
IDC(A)

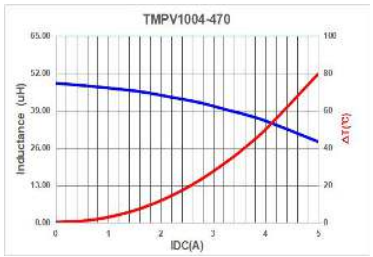

TMPV1004-100
Inductance (uH)
ΔT(℃)
IDC(A)


TMPV1004-120
Inductance (uH)
ΔT(℃)
IDC(A)

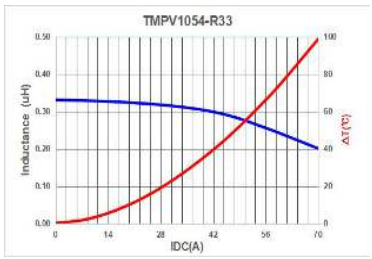

TMPV1004-150
Inductance (uH)
ΔT(℃)
IDC(A)

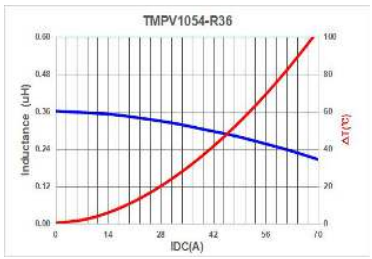

TMPV1004-220
Inductance (uH)
ΔT(℃)
IDC(A)

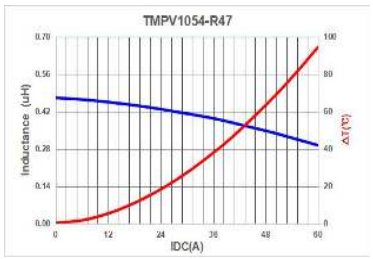

TMPV1004-330
Inductance (uH)
ΔT(℃)
IDC(A)

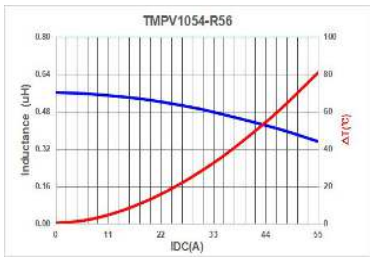

TMPV1004-470
Inductance (uH)
ΔT(℃)
IDC(A)

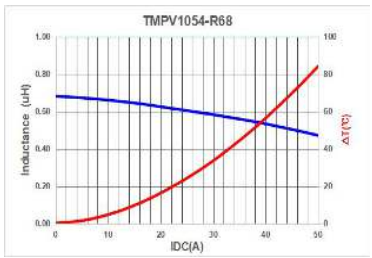
TMPV1054SV

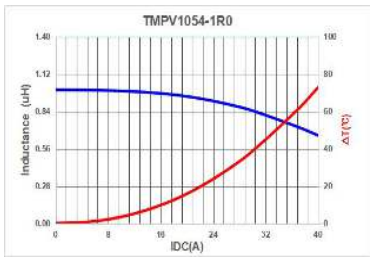

TMPV1054-R33
Inductance (uH)
ΔT(℃)
IDC(A)

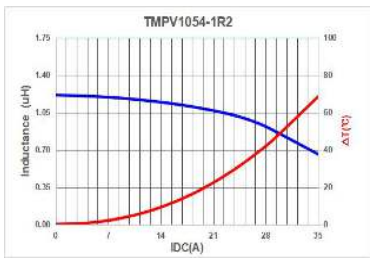

TMPV1054-R36
Inductance (uH)
ΔT(℃)
IDC(A)

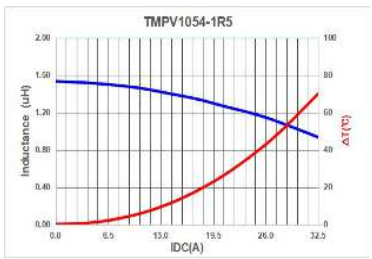

TMPV1054-R47
Inductance (uH)
ΔT(℃)
IDC(A)

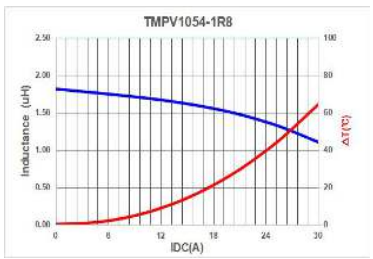

TMPV1054-R56
Inductance (uH)
ΔT(℃)
IDC(A)

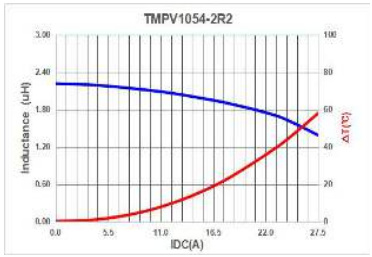

TMPV1054-R68
Inductance (uH)
ΔT(℃)
IDC(A)

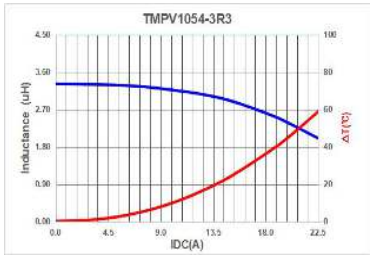

TMPV1054-1R0
Inductance (uH)
ΔT(℃)
IDC(A)

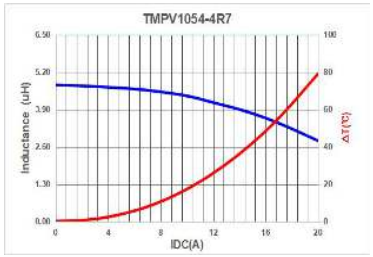

TMPV1054-1R2
Inductance (uH)
ΔT(℃)
IDC(A)

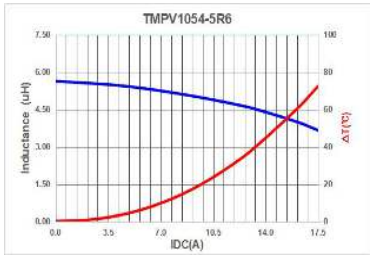

TMPV1054-1R5
Inductance (uH)
ΔT(℃)
IDC(A)

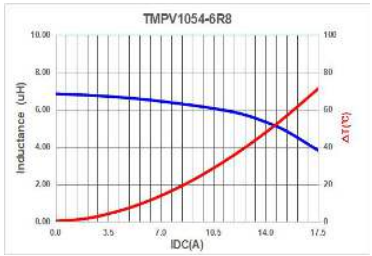

TMPV1054-1R8
Inductance (uH)
ΔT(℃)
IDC(A)

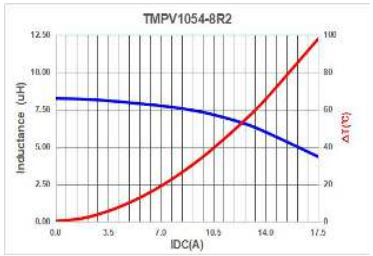

TMPV1054-2R2
Inductance (uH)
ΔT(℃)
IDC(A)

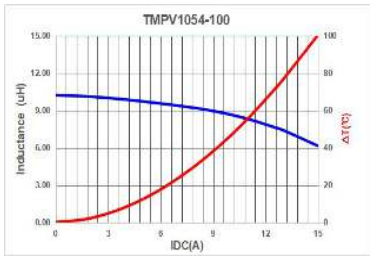

TMPV1054-3R3
Inductance (uH)
ΔT(℃)
IDC(A)

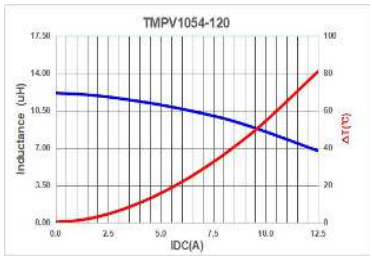

TMPV1054-4R7
Inductance (uH)
ΔT(℃)
IDC(A)

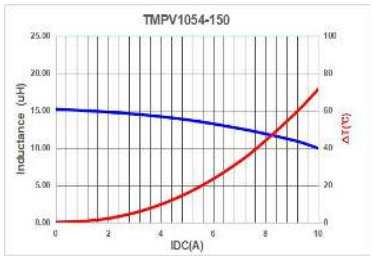

TMPV1054-5R6
Inductance (uH)
ΔT(℃)
IDC(A)

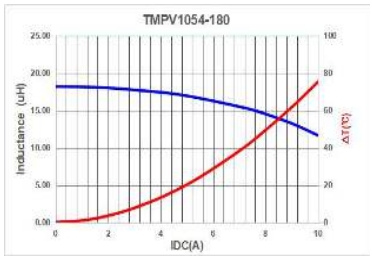

TMPV1054-6R8
Inductance (uH)
ΔT(℃)
IDC(A)

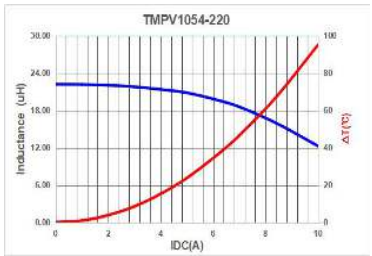

TMPV1054-8R2
Inductance (uH)
ΔT(℃)
IDC(A)

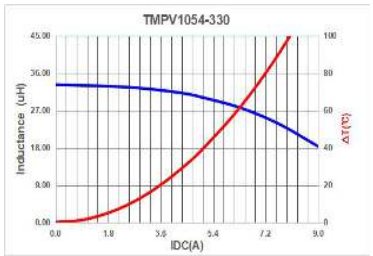

TMPV1054-100
Inductance (uH)
ΔT(℃)
IDC(A)

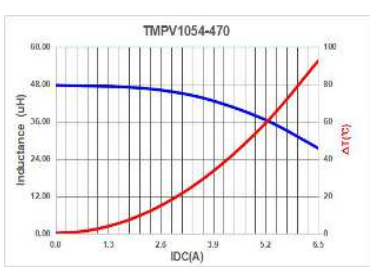

TMPV1054-120
Inductance (uH)
ΔT(℃)
IDC(A)

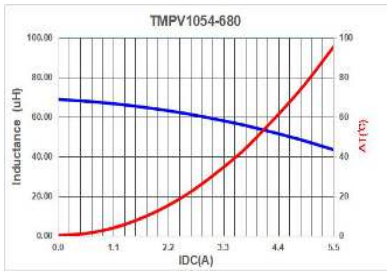

TMPV1054-150
Inductance (uH)
ΔT(℃)
IDC(A)

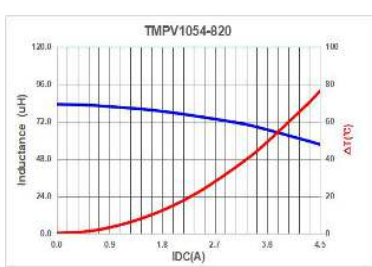

TMPV1054-180
Inductance (uH)
ΔT(℃)
IDC(A)

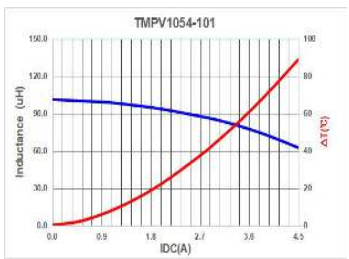

TMPV1054-220
Inductance (uH)
ΔT(℃)
IDC(A)


TMPV1054-330
Inductance (uH)
ΔT(℃)
IDC(A)

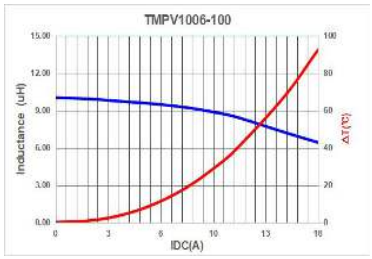

TMPV1054-470
Inductance (uH)
ΔT(℃)
IDC(A)

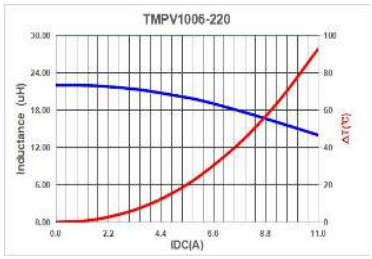

TMPV1054-680
Inductance (uH)
ΔT(℃)
IDC(A)

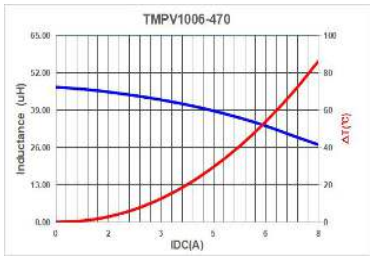

TMPV1054-820
Inductance (uH)
ΔT(℃)
IDC(A)


TMPV1054-101
Inductance (uH)
ΔT(℃)
IDC(A)

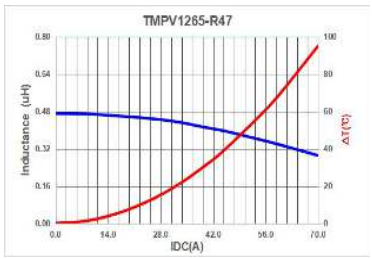
TMPV1006SPV

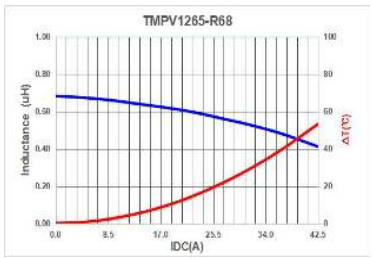


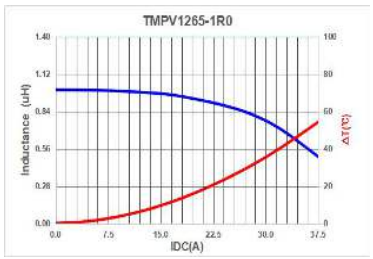


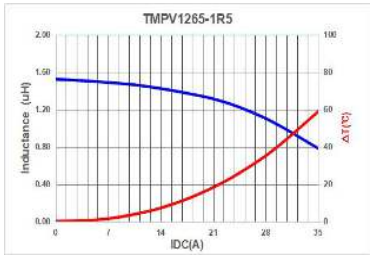


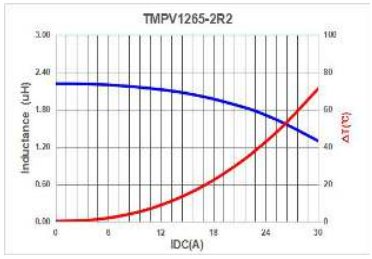
TMPV1265SPV

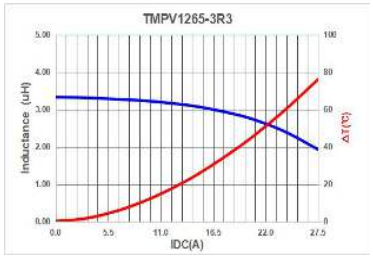


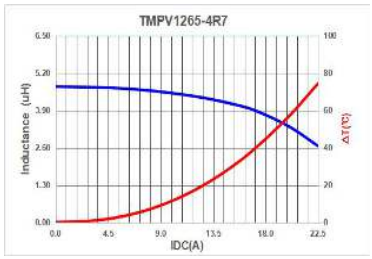


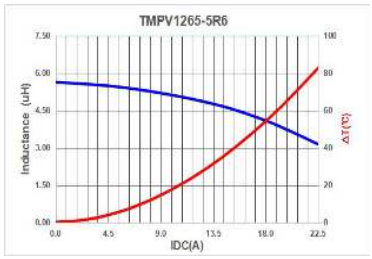


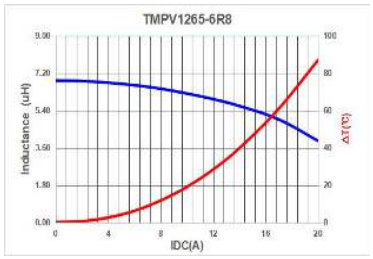


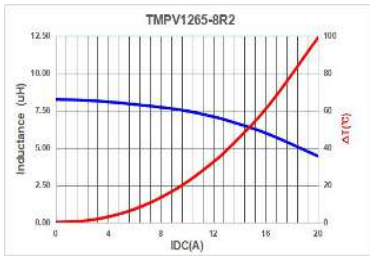


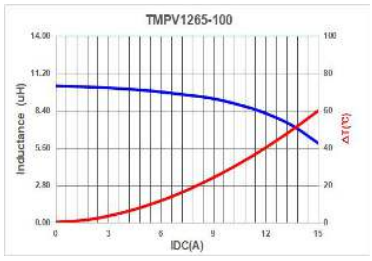


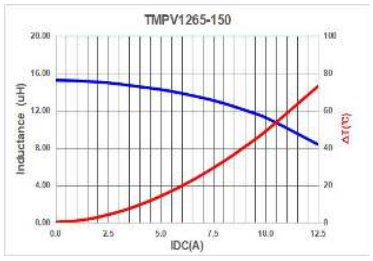


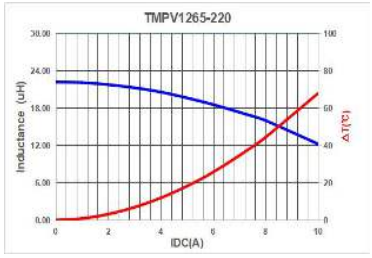


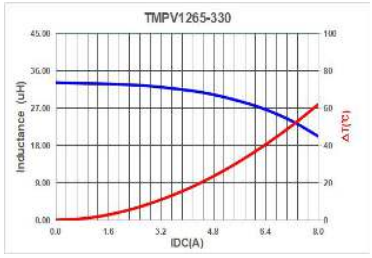


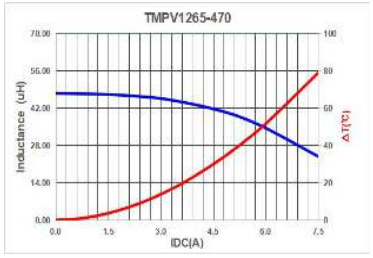


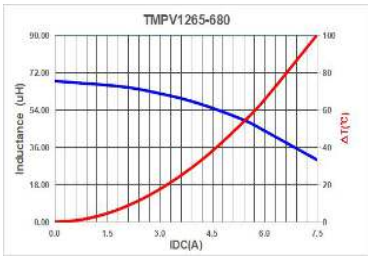


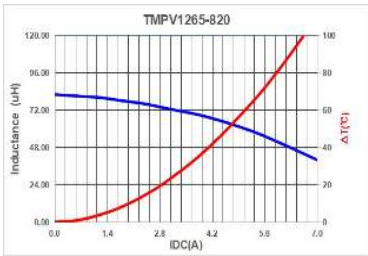


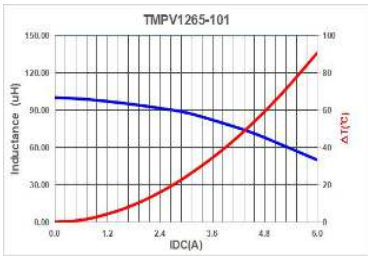







TMPV1265-680
Inductance (uH)
ΔT(℃)
IDC(A)


TMPV1265-820
Inductance (uH)
ΔT(℃)
IDC(A)


TMPV1265-101
Inductance (uH)
ΔT(℃)
IDC(A)

12、Appearance criterion

一、Introduction：

1. Scope：

This document was written for the purpose of helping customers better understand the **TMPA、TMHC、TMPV** products they are purchasing. It will give the customer an idea as to the type of cosmetic irregularities that may occur from time to time during the manufacturing of the component itself, or during their use of the component.

This document also discusses the criteria that have been developed for the rejection of irregularities that are determined to be excessive.

While it is desirable to have cosmetically perfect **TMPA、TMHC 、TMPV** inductors, the powdered iron manufacturing technique has cosmetic limitations.

Certified test labs have performed extensive environmental testing on **TMPA、TMHC、TMPV** inductors with and without cosmetic imperfections according to AEC-Q200 standards for thermal shock ,mechanical shock, vibration, humidity, and others. This testing has shown that the cosmetic imperfections listed in this document do not affect the performance or reliability of the **TMPA、TMHC 、TMPV** inductors.

Test results are available upon request.

2.Product：

The **TMPA、TMHC、TMPV** inductors are different from most inductors. The inductor body is a soft magnetic composite (SMC), not a ferrite. It is made from an iron powder mixture and cemented together using a resin binder. This powder mixture, when pressed around the inductor coil, greatly enhances the electrical properties of the inductor and gives protection from environmental forces. After pressing, the component is cured in an oven to increase the bonding strength of the resin binders with the iron powder, yielding excellent electrical and physical properties.

3. The TMPA、TMHC、TMPV inductors provide the best combination of:

- Inductance
- Low core loss
- Saturation
- Temperature stability
- Smallest footprint
- Lowest profile

二、Surface irregularities：

The following pages include descriptions of the most common irregularities seen on **TMPA、TMHC、TMPV** inductors. Common causes are described along with variations in their magnitude. Customers may sometimes see one or all of these irregularities.

Those that are determined to adversely affect the customer's use of the component are rejected, thought minor (acceptable) irregularities can occasionally be present. With the use of this guide, a customer will has better understand the effect of each irregularity.

TMPA&TMHC

TMPV

Cracks

TMPA&TMHC

TMPV

Chip off

TMPA&TMHC

TMPV

Oxidation

1.Cracks：

Cracks within the inductor body are unavoidable during the manufacturing process. Small cracks are caused by die wall friction when the parts are ejected during the pressing process, and by expansion of the coil during the process of curing the resin binder in the powdered iron body. Unlike ferrite material, cracks on the body do not affect the electrical performance of the component.

Reliability testing has shown that even cracks in excess of 0.005 inch will not cause the component to fail electrically or physically in field applications. Acceptance widths are adopted based on the ability to detect cracks both at the component and circuit level.


TMPA&TMHC TMPV

Terminal area crack, acceptable
Cracks coming from the top corner of the terminal are normal and are caused by terminal expansion during curing operations.

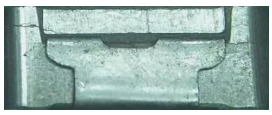

TMPA&TMHC TMPV

Negligible crack, acceptable
Negligible cracks are those that are nearly invisible without magnification.


TMPA&TMHC TMPV

Minor crack, acceptable
Minor cracks are those that are visible without magnification but are not apparent without close inspection.

1-1. Crack：

TMPA&TMHC TMPV

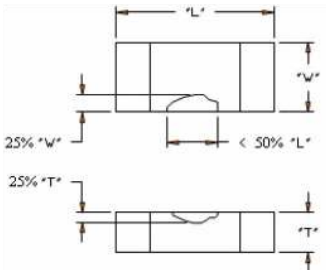
Moderate crack, rejectable
Moderate cracks are those that are obvious upon inspection and extend across most of the component.


TMPA&TMHC TMPV

Major crack, rejectable
Major cracks are those that are obvious to a customer and would possibly result in large chip-outs that would expose the coil and lead frame.

2.Chip off：

Chipping of the inductor body can occur during normal processing and testing of the inductor. The acceptance criteria for chipping vary with the size of the component, our current acceptance standards are based on IPC-A-610. The effect of chipping is negligible as long as the inductor coil is not showing.
See IPC standard for class 1 and 2 components below.



T	25 % of the thickness
W	25 % of the width
L	50 % of the length

Chips typically occur on the edges and corners of the inductor body They are slightly darker in color and rougher in appearance than the surrounding material.

TMPA&TMHC TMPV

Minor chipping, acceptable
Minor chips in the inductor body are those that are typically shallow imperfections that occur on the corners and edge of components.
No coil wire or lead frame is showing and the chip does not affect the performance or reliability of the component.

TMPA&TMHC TMPV

TMPA&TMHC TMPV

Major chipping, rejectable
Major chips in the inductor body are those that are very obvious to the customer and may expose the wire coil or lead frame.

3. Oxidation：

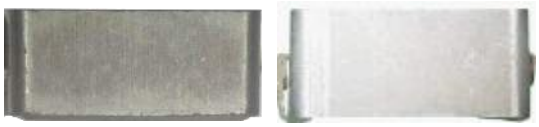
The **TMPA、TMHC、TMPV** inductors is predominately iron, and oxidation may occur in a small percentage of inductors. Resin binders give moderate protection, but some slight oxidation may occur. All components should be stored away from heat, humidity, and ionized atmospheres as much as possible before mounting.

Basic steps should be taken in order to limit surface oxidation, including keeping the **TMPA、TMHC、TMPV** inductors sealed in their packaging until PCB mounting.

In case that oxidation does occur, the effects are contained only in the surface of the component and will not penetrate into the core material. No electrical effects have ever been documented due to oxidation of the **TMPA、TMHC、TMPV** products. Oxidation should never be considered a reliability risk.

TMPA&TMHC TMPV

Top view



TMPA&TMHC TMPV

Side view

4.Other：

A very small number of other irregularities have been reported. These occur at an exceedingly low rates and typically do not affect the components electrically. These include: Foreign material may be seen pressed into the upper terminals. This material is of the same material as the inductor body and should not be a reason for rejection unless solderability is affected.

TMPA&TMHC TMPV

Foreign material: acceptable

TMPA&TMHC TMPV

Scratch: acceptable

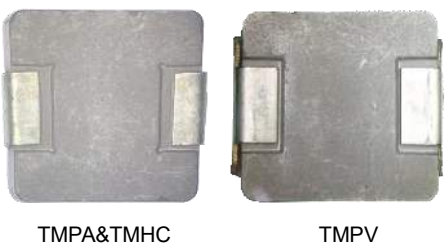
Scratches may be seen on the surface of the inductor body.
Scratches are an acceptable surface irregularity.

TMPA&TMHC TMPV

Imprinting：acceptable

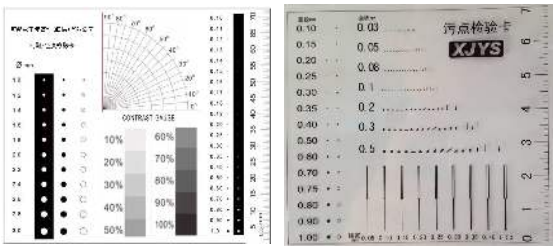
TMPA&TMHC TMPV

Blackening:PAD black/ brightness ratio less than 20% is OK



TMPA&TMHC TMPV

Yellowing：PAD yellowing ratio less than 20% is OK



三 Summary：

The **TMPA、TMHC、TMPV** inductors are comprised of an iron powder body compressed around a coil. Due to the fact that this iron powder body is not as solid like sintered ferrite material, irregularities such as cracks and chips do not affect the electrical properties or the reliability of the component. Criteria have been determined for the acceptability of the components that allow for a robust manufacturing process as well as an acceptable degree of cosmetic irregularity.

Reliability testing has been done on the effects of cracking of the iron powder body and on the oxidation of the iron particles that are present on the surface. Testing has shown no reliability issues from either of these cosmetic differences, Please feel free to use it!

The products described herein and this document technical questions and specific disclaimer, If you have any questions or need, please contact our corresponding business specialist or E-mail at sales@tai-tech.com.tw.

Thank you for your support!