

FrelTec GmbH

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Germany

SMD Power Inductors Metal Coating (Ultra high Current)

SPECIFICATION

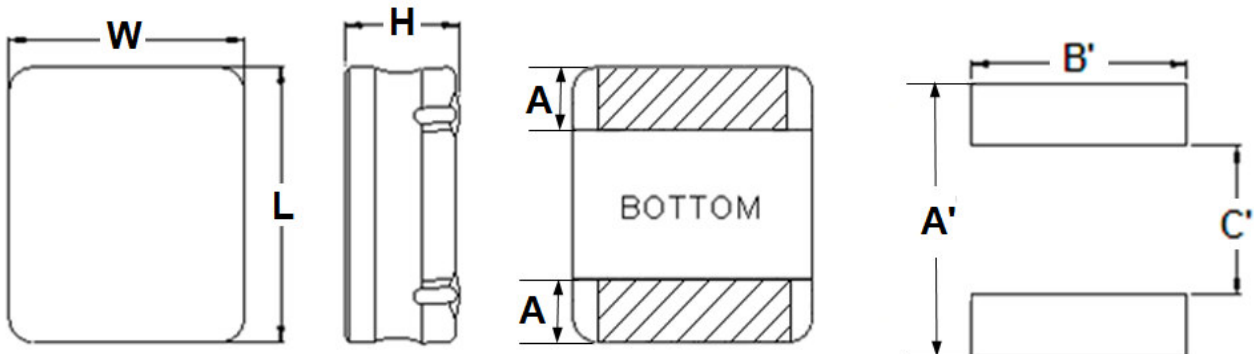
Part Number

153	3030*	101*	M	M	E02**	5
Type	Size	Value	Specification	Tolerance	Packing	Thick-ness
153 : SMD Power Inductor Metal Coating Molding (Ultra High Current)	2016: 2,0x1,6mm	The value is given in μH and "u" indicates the decimal point. When higher than $100\mu\text{H}$ then l the last digit is the multiplier which denotes the number of zero following	S: Standard Type	M: $\pm 20\%$ (standard)	E03 : Embossed tape and reel for 3k pcs (7"reel) for Size: 2016 and 2520	1: 0,1 mm
	2520: 2,5x2,0mm		H: High Current Type	N: $\pm 30\%$		2: 0,2 mm
	3030: 3,0x3,0mm		T: Specific Type		E02 : Embossed tape and reel for 2k pcs (7"reel) Size: 3030	3: 0,3 mm
	4040: 4,0x4,0mm	Example: 3U3 : 3,3 μH 220 : 22 μH 151 : 150 μH			E01 : Embossed tape and reel for 1k pcs (7"reel) Size: 4040	4: 0,4 mm
	4141: 4,1x4,1mm					5: 0,5 mm
						6: 0,6 mm
					EY7 : Embossed tape and reel for 700 pcs (7"reel) Size: 4141	7: 0,7 mm
						8: 0,8 mm
						9: 0,9 mm
						A: 1,0 mm
						B: 1,1 mm
						C: 1,2 mm
						D: 1,4 mm
						E: 1,5 mm
						F: 1,6 mm
						G: 1,8 mm
						H: 2,0 mm
						I: 2,4 mm
					J: 2,5 mm	
					K: 2,8 mm	
						L: 3,0 mm
						M: 3,5 mm
						N: 4,0 mm
						P: 4,5 mm
						Q: 5,0 mm
						R: 6,0 mm
						S: 6,5 mm
						T: 2,6 mm
						U: 7,0 mm
						V: 9,0 mm
						W: 5,5 mm
						X: 13 mm
						Z: 3,2 mm

All products according to RoHS (2015/863/EU)

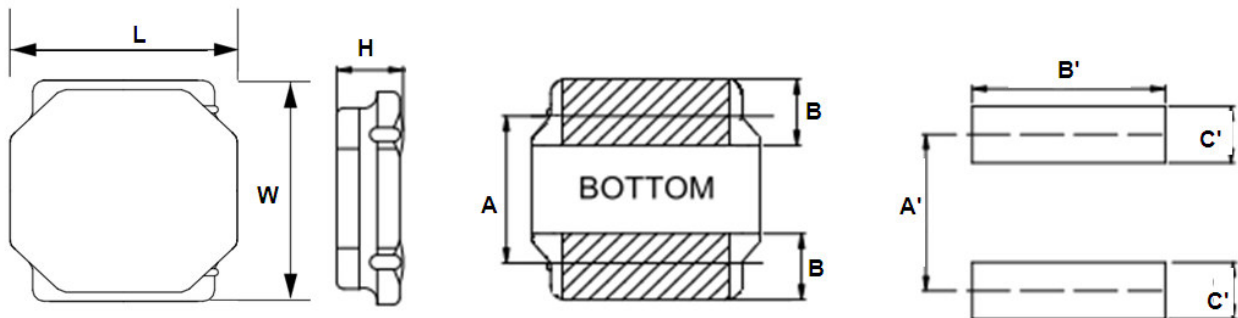
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Dimensions and land pattern:



Recommended Land Patterns

Series	Quantity per Reel (pcs)	L (mm)	W (mm)	H (mm)	A (mm)	Recommended Land Patterns		
						A' (mm)	B' (mm)	C' (mm)
1532016__H_E03A	3000	2,0±0,3	1,6±0,3	1,0+0,1 -0,2	0,6±0,2	2,3	1,7	0,6
1532520__SME03A	3000	2,5±0,3	2,0±0,2	1,0 Max	0,85±0,2	2,6	2,1	0,8
1532520__H_E03A	3000	2,5±0,3	2,0±0,3	1,0+0,1 -0,2	0,85±0,2	2,6	2,1	0,8
1532520__H_E03C	3000	2,5±0,3	2,0±0,3	1,2+0,1 -0,2	0,85±0,2	2,6	2,1	0,8
1532520__HME03A	3000	2,5±0,3	2,0±0,3	1,0+0,1 -0,2	0,85±0,2	2,6	2,1	0,8
1533030__HME02A	2000	3,0±0,2	3,0±0,2	1,0+0,1 -0,2	0,9±0,2	2,2	2,7	0,8
1534141__H_EY7H	700	4,1±0,2	4,1±0,2	1,2 Max	1,2±0,3	2,8	3,7	1,2



Recommended Land Patterns

Series	Quantity per Reel (pcs)	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Recommended Land Patterns		
							A' (mm)	B' (mm)	C' (mm)
1533030__HME02C	2000	3,0±0,2	3,0±0,2	1,2 Max	1,9±0,2	0,9±0,2	2,2	2,7	0,8
1534040__HME01A	1000	4,0±0,2	4,0±0,2	1,0 Max	2,5±0,2	1,1±0,2	2,8	3,7	1,2
1534040__HME01C	1000	4,0±0,2	4,0±0,2	1,2 Max	2,5±0,2	1,1±0,2	2,8	3,7	1,2

Part Numbers & Characteristic

Order code	Inductance L (uH)	Tolerance	DC Resistance (mΩ)		Heat Rating Current DC Amps. Idc(A)		Saturation Current DC Amps. Isat(A)		Mar- king
			Typ.	Max.	Typ.	Max.	Typ.	Max.	
1532016U47HNE03A	0,47	± 30%	40,0	48,0	3,60	3,40	4,30	3,60	—
1532016U68HNE03A	0,68	± 30%	47,0	56,0	2,85	2,60	3,60	3,00	—
15320161U0HNE03A	1,0	± 30%	63,0	75,0	2,70	2,50	3,00	2,40	—
15320161U5HNE03A	1,5	± 30%	100,0	120,0	2,25	2,15	2,15	1,80	—
15320162U2HME03A	2,2	± 20%	135,0	160,0	1,75	1,60	1,85	1,55	—
15320163U3HME03A	3,3	± 20%	193,0	230,0	1,70	1,50	1,50	1,25	—
15320164U7HME03A	4,7	± 20%	280,0	340,0	1,30	1,25	1,20	1,00	—
15320166U8HME03A	6,8	± 20%	450,0	540,0	1,02	0,97	1,00	0,84	—
1532016100HME03A	10,0	± 20%	570,0	685,0	0,95	0,90	0,90	0,75	—
1532520U24SME03A	0,24	± 20%	26,5	31,0	4,30	4,10	8,10	6,80	—
1532520U33SME03A	0,33	± 20%	30,0	36,0	4,10	3,60	7,30	6,10	—
1532520U47SME03A	0,47	± 20%	37,0	44,5	3,60	3,10	6,60	5,50	—
1532520U68SME03A	0,68	± 20%	52,0	62,0	3,10	2,70	4,40	4,05	—
15325201U0SME03A	1,0	± 20%	67,0	80,0	2,95	2,55	4,10	3,35	—
15325201U5SME03A	1,5	± 20%	88,0	106,0	2,25	1,95	3,45	2,85	—
15325202U2SME03A	2,2	± 20%	124,0	150,0	1,85	1,55	3,20	2,60	—
15325203U3SME03A	3,3	± 20%	185,0	222,0	1,45	1,25	2,50	2,10	—
15325204U7SME03A	4,7	± 20%	240,0	290,0	1,30	1,10	2,15	1,75	—
15325206U8SME03A	6,8	± 20%	360,0	435,0	1,15	0,96	1,70	1,40	—
153252010USME03A	10,0	± 20%	440,0	530,0	0,96	0,85	1,55	1,28	—
1532520U47HNE03A	0,47	± 30%	37,0	44,5	3,60	3,10	6,60	5,50	—
1532520U68HNE03A	0,68	± 30%	52,0	62,0	3,10	2,70	4,40	4,05	—
15325201U0HNE03A	1,0	± 30%	67,0	80,0	2,95	2,55	4,10	3,35	—
15325201U5HNE03A	1,5	± 30%	88,0	106,0	2,25	1,95	3,45	2,85	—
15325202U2HME03A	2,2	± 20%	124,0	150,0	1,85	1,55	3,20	2,60	—

Order code	Inductance L (uH)	Tolerance	DC Resistance (mΩ)		Heat Rating Current DC Amps. Idc(A)		Saturation Current DC Amps. Isat(A)		Marking
			Typ.	Max.	Typ.	Max.	Typ.	Max.	
15325203U3HME03A	3,3	± 20%	185,0	222,0	1,45	1,25	2,50	2,10	—
15325204U7HME03A	4,7	± 20%	240,0	290,0	1,30	1,10	2,15	1,75	—
15325206U8HME03A	6,8	± 20%	360,0	435,0	1,15	0,96	1,70	1,40	—
153252010UHME03A	10,0	± 20%	440,0	530,0	0,96	0,85	1,55	1,28	—
1532520U47HNE03C	0,47	± 30%	28,5	34,5	4,60	4,20	5,50	4,60	—
1532520U68HNE03C	0,68	± 30%	33,5	40,2	3,90	3,40	4,00	3,30	—
15325201U0HNE03C	1,0	± 30%	46,5	55,5	3,50	3,20	3,70	3,00	—
15325201U2HNE03C	1,2	± 30%	57,0	68,5	3,40	3,15	3,55	2,95	—
15325201U5HNE03C	1,5	± 30%	66,5	80,0	3,00	2,80	2,90	2,40	—
15325202U2HME03C	2,2	± 20%	93,0	111,0	2,60	2,30	2,50	2,10	—
15325203U3HME03C	3,3	± 20%	128,0	154,0	2,20	2,00	1,90	1,60	—
15325204U7HME03C	4,7	± 20%	190,0	230,0	1,85	1,70	1,60	1,30	—
15325206U8HME03C	6,8	± 20%	220,0	265,0	1,60	1,50	1,35	1,10	—
1532520100HME03C	10,0	± 20%	435,0	480,0	1,00	0,85	1,35	1,10	—
1532520U47HME03A	0,47	± 20%	55,0	65,0	3,1	3,0	5,5	4,0	—
1533030U47HME02A	0,47	± 20%	33,0	39,0	4,50	3,90	6,50	5,40	—
15330301U0HME02A	1,0	± 20%	74,0	86,0	2,80	2,40	5,20	4,40	—
15330301U5HME02A	1,5	± 20%	87,0	100,0	2,40	2,10	3,50	3,00	—
15330302U2HME02A	2,2	± 20%	125,0	144,0	2,20	1,90	3,00	2,50	—
15330303U3HME02A	3,3	± 20%	215,0	248,0	1,50	1,35	2,40	2,00	—
15330304U7HME02A	4,7	± 20%	300,0	345,0	1,30	1,15	2,00	1,70	—
15330306U8HME02A	6,8	± 20%	380,0	437,0	1,15	1,00	1,70	1,40	—
153303010UHME02A	10,0	± 20%	500,0	575,0	1,00	0,85	1,30	1,10	—
1533030U33HME02C	0,33	± 20%	17,0	20,0	6,40	5,50	8,70	6,40	—
1533030U47HME02C	0,47	± 20%	23,0	27,0	5,50	4,70	7,50	6,30	—
15330301U0HME02C	1,0	± 20%	43,0	50,0	3,90	3,30	5,10	4,30	—

Order code	Inductance L (uH)	Tolerance	DC Resistance (mΩ)		Heat Rating Current DC Amps. Idc(A)		Saturation Current DC Amps. Isat(A)		Mar-king
			Typ.	Max.	Typ.	Max.	Typ.	Max.	
15330301U5HME02C	1,5	± 20%	64,0	74,0	3,00	2,50	4,10	3,40	—
15330302U2HME02C	2,2	± 20%	97,0	112,0	2,40	2,10	3,60	2,80	—
15330303U3HME02C	3,3	± 20%	145,0	167,0	1,90	1,65	2,70	2,10	—
15330304U7HME02C	4,7	± 20%	228,0	263,0	1,55	1,35	2,30	1,80	—
1534040U47HME01A	0,47	± 20%	35,0	40,0	4,50	4,00	7,90	6,00	—
15340401U0HME01A	1,0	± 20%	60,0	69,0	3,50	3,00	5,70	4,70	—
15340401U5HME01A	1,5	± 20%	73,0	84,0	3,10	2,70	4,00	3,00	—
15340402U2HME01A	2,2	± 20%	100,0	115,0	2,70	2,40	3,10	2,40	—
15340403U3HME01A	3,3	± 20%	175,0	200,0	2,00	1,80	2,60	2,00	—
15340404U7HME01A	4,7	± 20%	220,0	250,0	1,90	1,60	2,30	1,90	—
15340406U8HME01A	6,8	± 20%	320,0	370,0	1,50	1,30	1,80	1,50	—
153404010UHME01A	10,0	± 20%	440,0	510,0	1,30	1,10	1,70	1,40	—
1534040U47HME01C	0,47	± 20%	25,0	29,0	5,40	4,60	10,00	7,50	—
15340401U0HME01C	1,0	± 20%	41,0	47,0	4,20	3,50	7,50	5,20	—
15340401U2HME01C	1,2	± 20%	41,0	47,0	4,20	3,50	6,20	4,20	—
15340401U5HME01C	1,5	± 20%	56,0	65,0	3,60	3,20	5,60	4,50	—
15340402U2HME01C	2,2	± 20%	69,0	79,0	3,20	2,80	4,50	3,80	—
15340403U3HME01C	3,3	± 20%	113,0	130,0	2,50	2,20	4,00	3,20	—
15340404U7HME01C	4,7	± 20%	140,0	160,0	2,20	1,90	3,00	2,50	—
15340406U8HME01C	6,8	± 20%	200,0	230,0	1,80	1,60	2,20	1,90	—
153404010UHME01C	10,0	± 20%	280,0	330,0	1,60	1,40	2,00	1,70	—
1534141U33HNEY7H	0,33	± 30%	11,0	13,0	8,10	7,00	21,00	16,00	—
1534141U47HNEY7H	0,47	± 30%	11,0	13,0	8,10	7,00	15,00	10,00	—
1534141U68HMEY7H	0,68	± 20%	14,0	16,0	6,00	5,20	12,00	8,00	—
15341411U0HMEY7H	1,0	± 20%	23,5	28,0	5,10	4,40	9,40	7,00	—
15341411U5HMEY7H	1,5	± 20%	35,0	41,0	4,70	4,10	9,40	6,80	—
15341412U2HMEY7H	2,2	± 20%	47,0	54,0	4,00	3,50	7,50	5,40	—

Order code	Inductance L (uH)	Tolerance	DC Resistance (mΩ)		Heat Rating Current DC Amps. I _{dc} (A)		Saturation Current DC Amps. I _{sat} (A)		Mar- king
			Typ.	Max.	Typ.	Max.	Typ.	Max.	
15341413U3HMEY7H	3,3	± 20%	66,0	75,0	3,30	3,00	5,20	3,70	—
15341414U7HMEY7H	4,7	± 20%	93,0	107,0	2,80	2,50	5,00	3,50	—
15341416U8HMEY7H	6,8	± 20%	138,0	158,0	2,30	2,00	4,00	2,90	—
153414110UHMEY7H	10,0	± 20%	169,0	194,0	1,90	1,60	3,10	2,20	—
153414115UHMEY7H	15,0	± 20%	275,0	350,0	1,65	1,12	2,40	1,30	—
153414122UHMEY7H	22,0	± 20%	400,0	460,0	1,40	1,20	1,60	1,35	—

Test Frequency: 1 MHz , 1,0V

All test data is referenced to 25°C ambient.

Operating Temperature Range -40°C to + 125°C.

I_{dc} (I_{rms}): DC current (A) that will cause an approximate ΔT of 40°C.

I_{sat}: DC current (A) that will cause L to drop approximately 30%.

The part temperature (ambient + temp rise) should not exceed 125°C under worse case operating conditions. Circuit design, component placement, PWB trace and thickness, airflow and other cooling provision all the part temperature. Part temperature should be verified in the end application.

Test Instrument: Inductance (CH-3302+CH-1320); R_{dc} (CH 16502)

Caution Temperature Rise

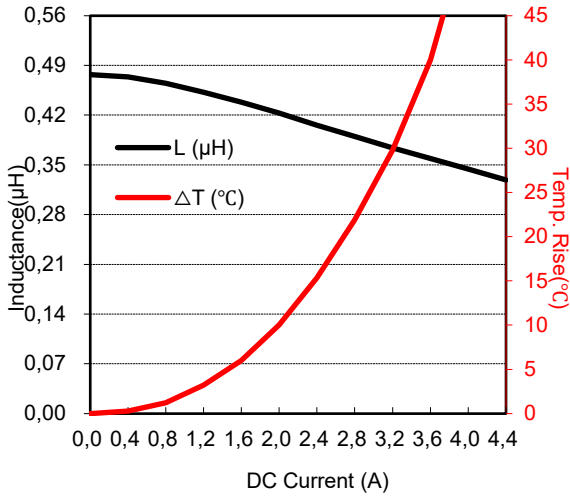
Temperature rise of this inductor depends on the installed board condition.

It shall be confirmed in the actual end product that temperature rise of inductor is within operation temperature.

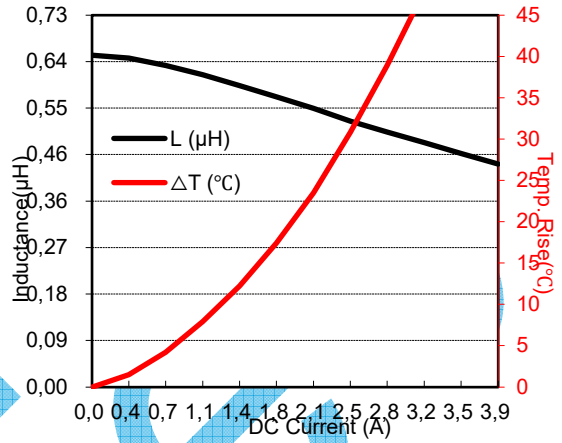
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Current Characteristics

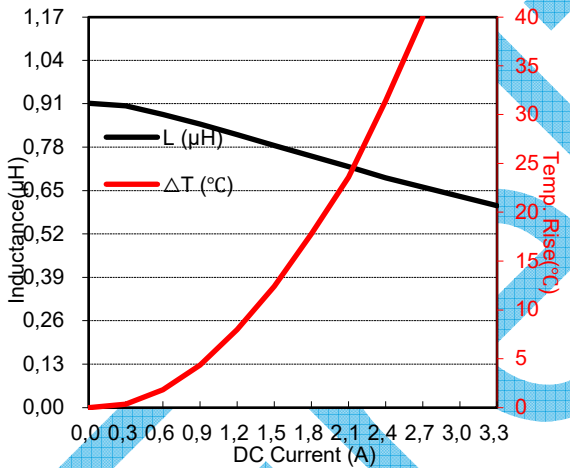
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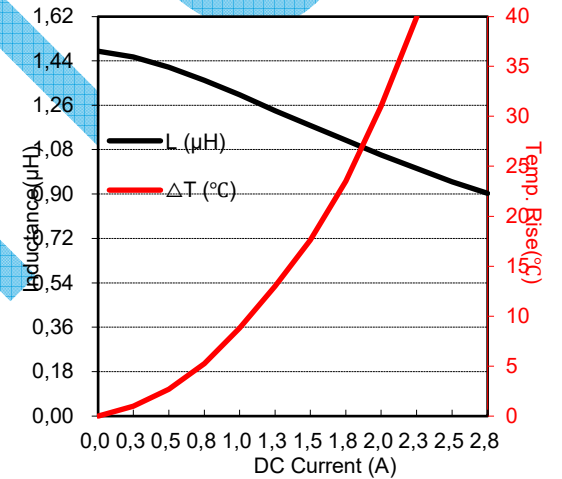
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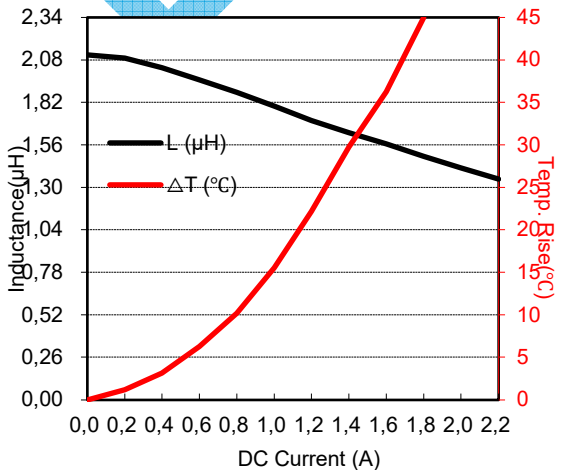
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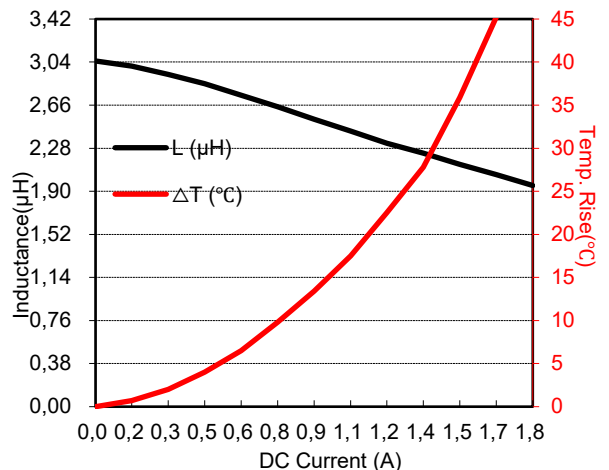
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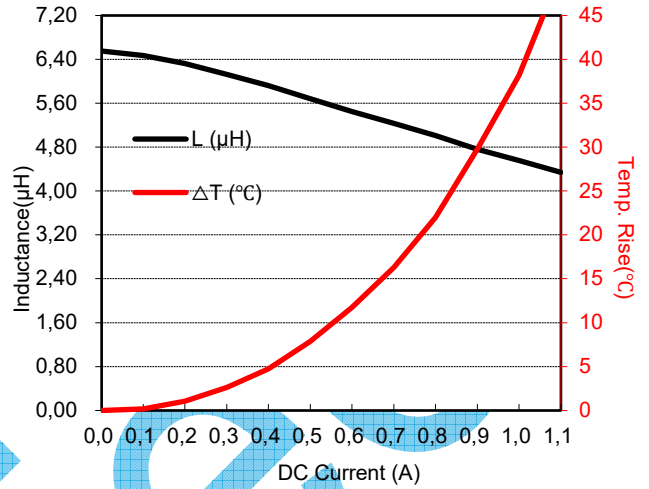
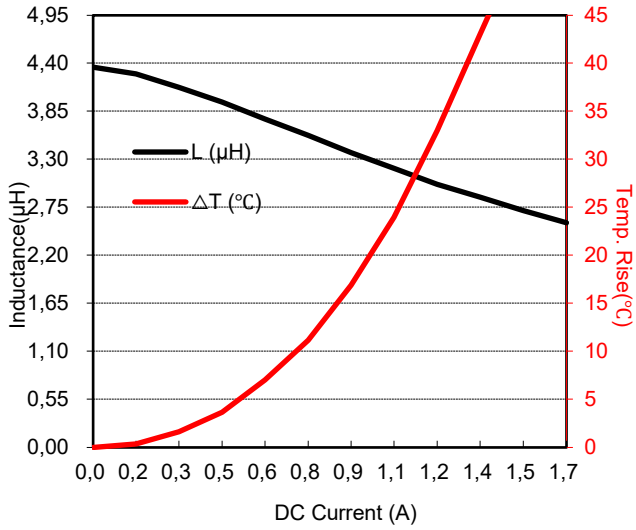


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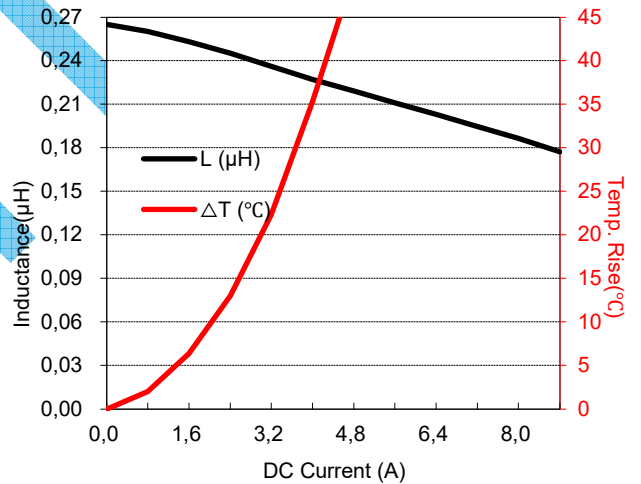
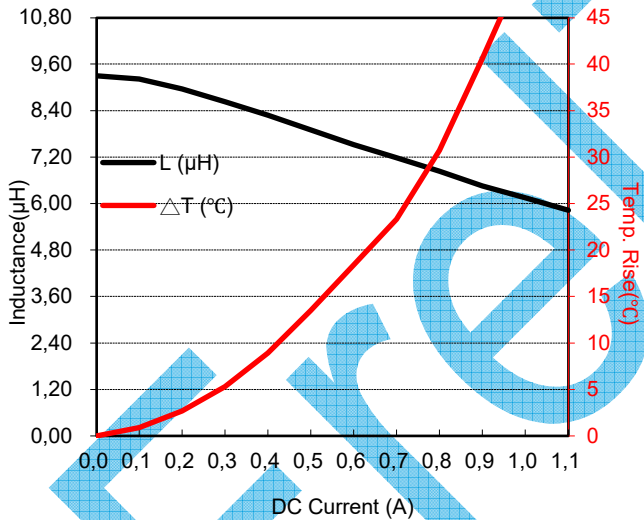
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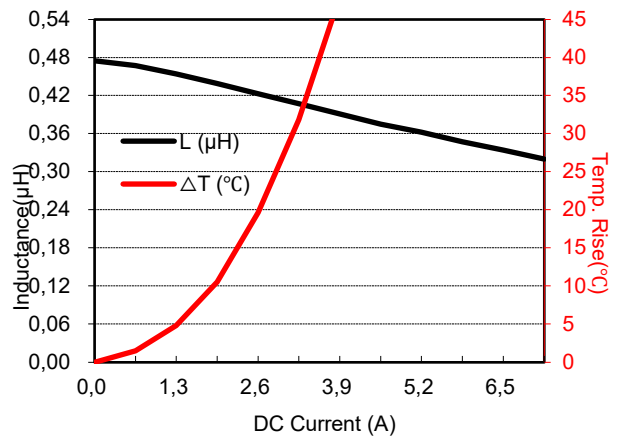
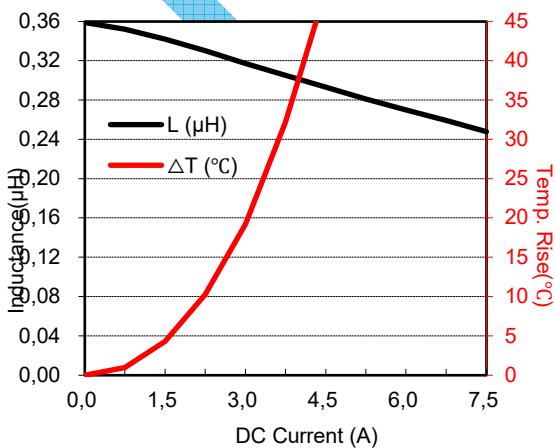
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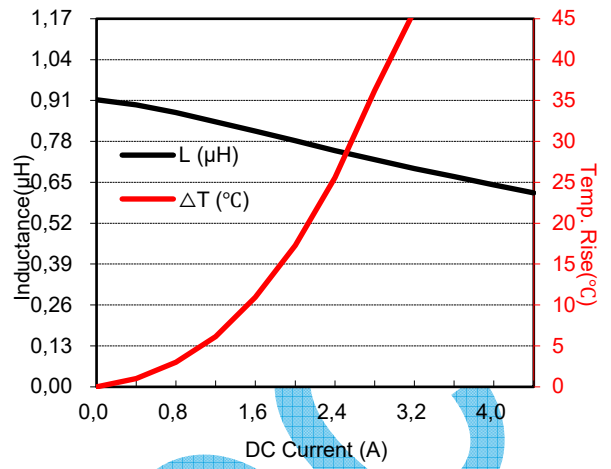
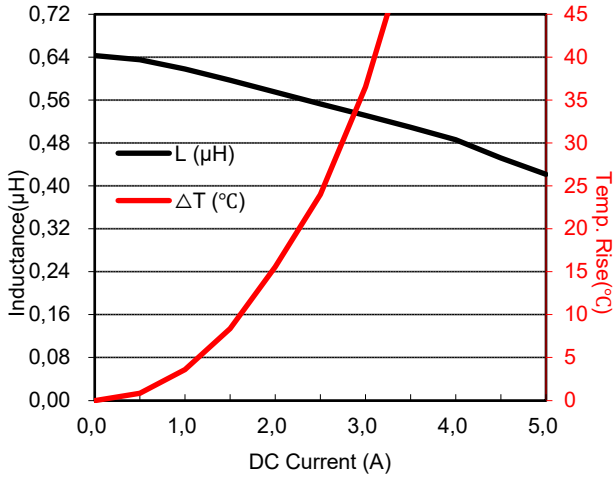


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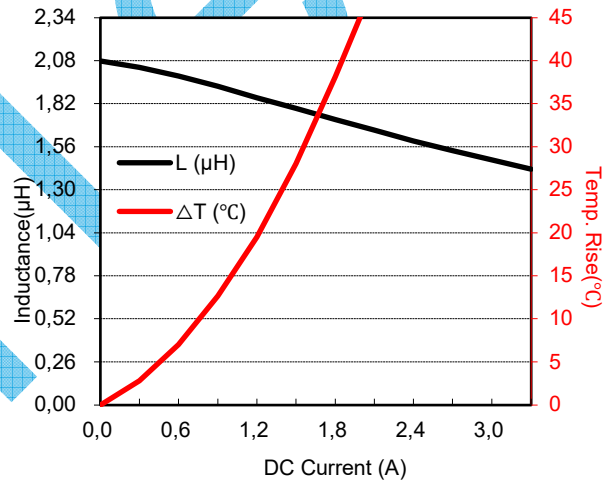
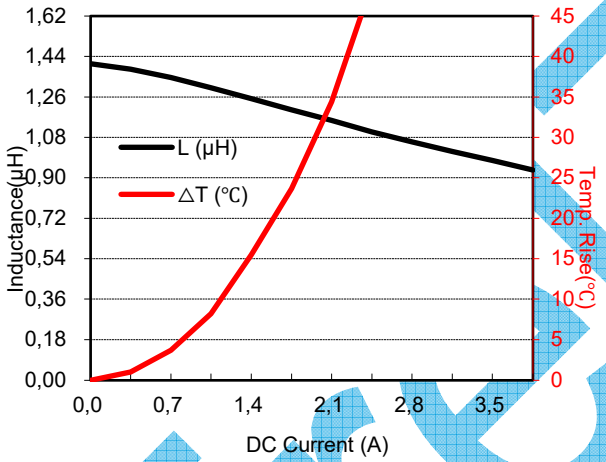
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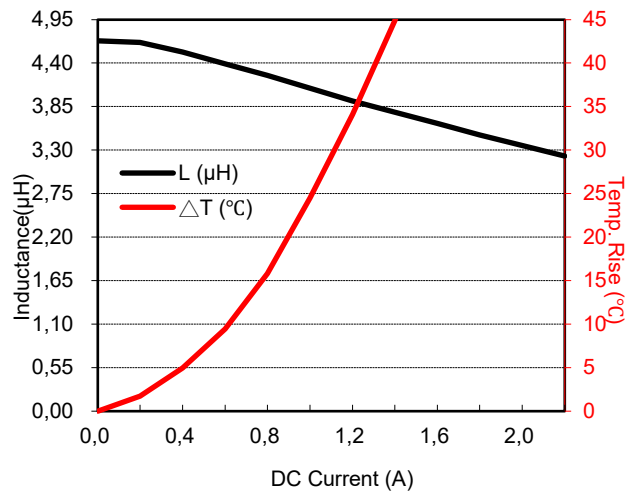
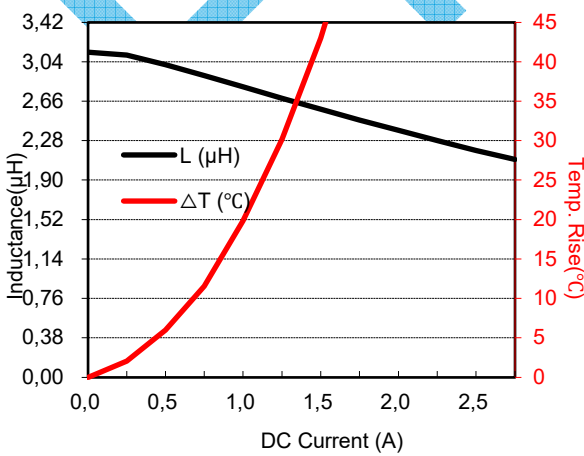
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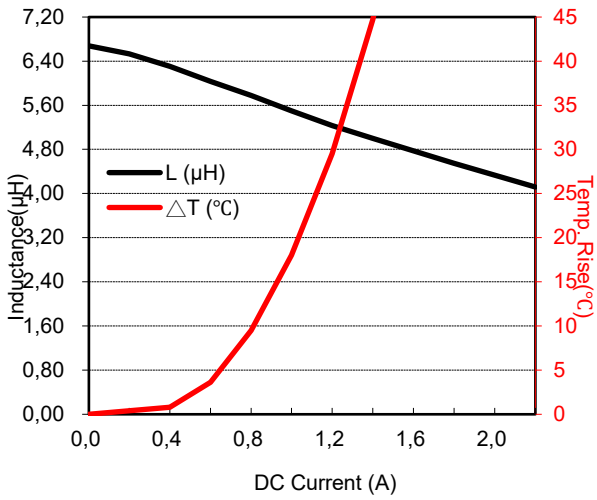
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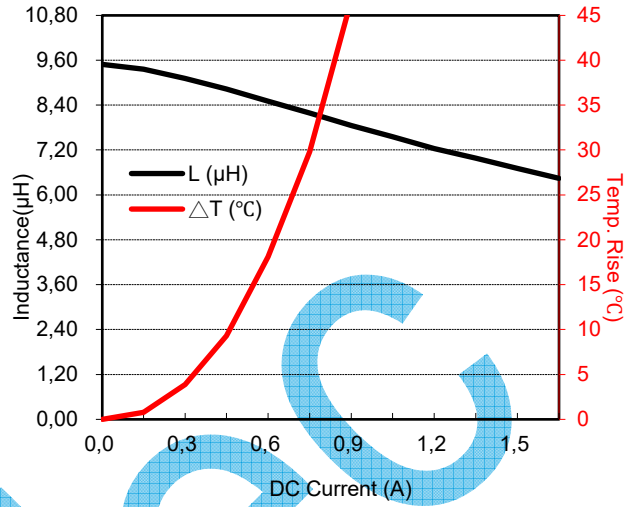
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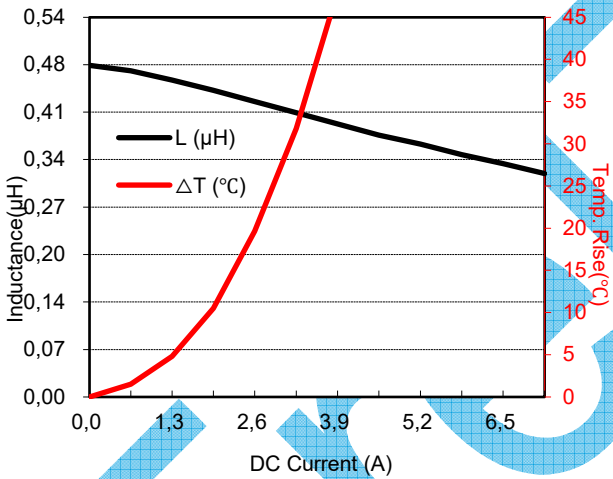


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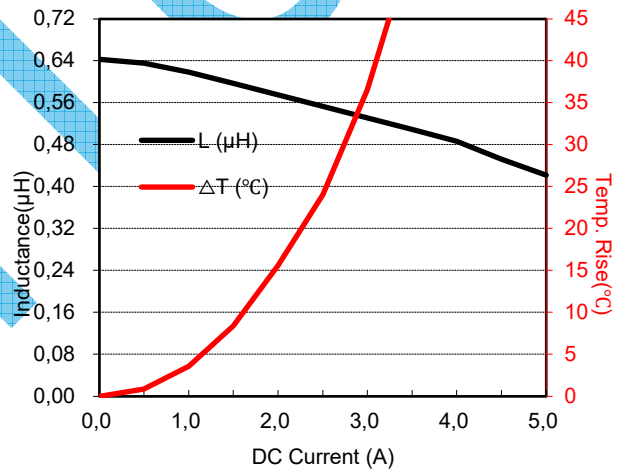
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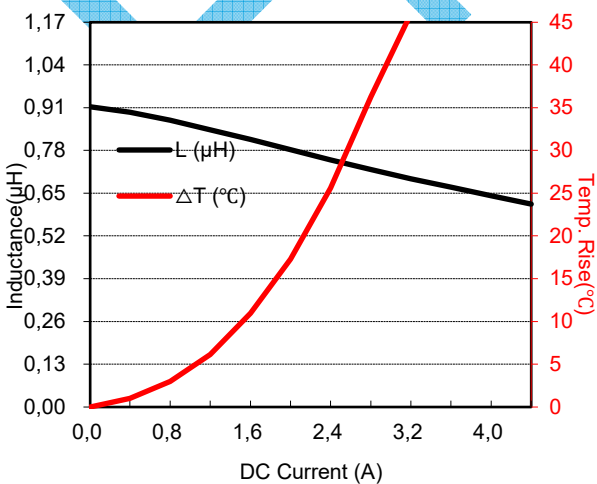
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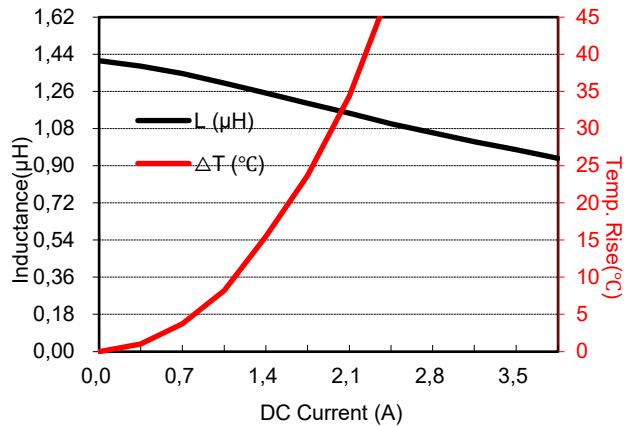
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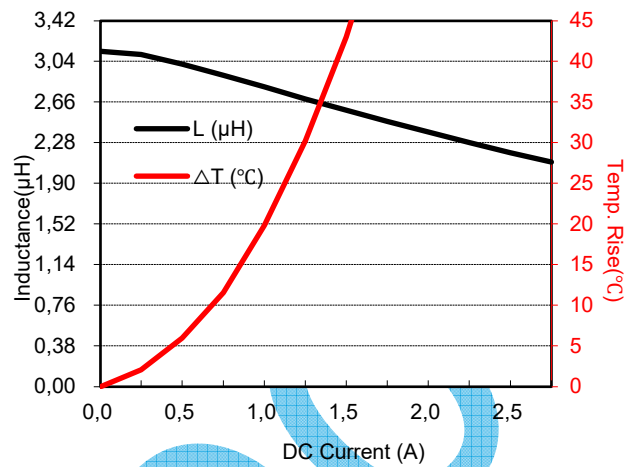
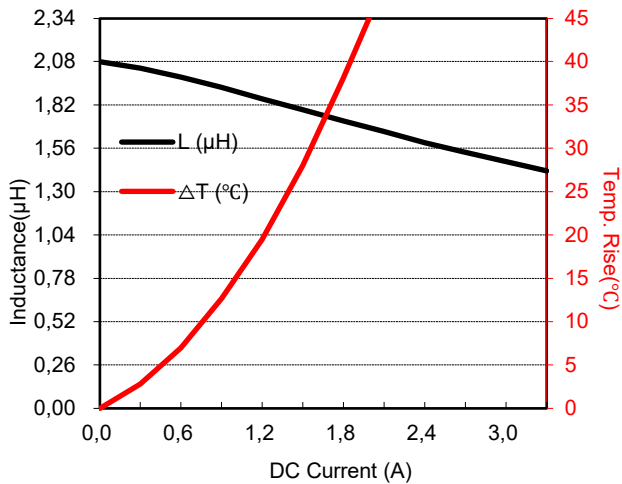


SMD

SMD Power Inductors

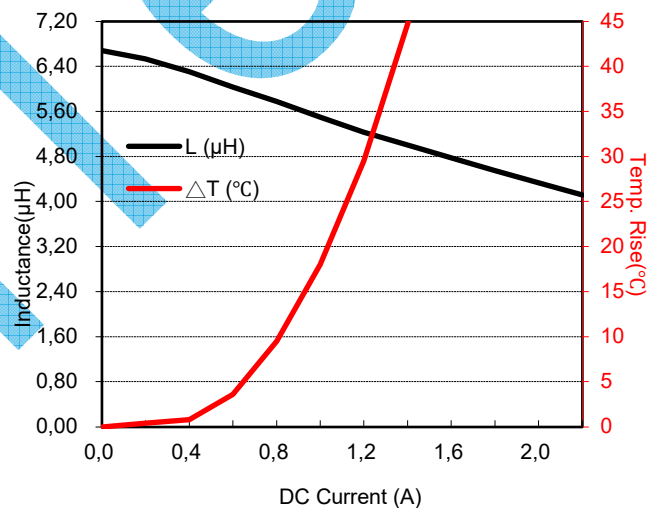
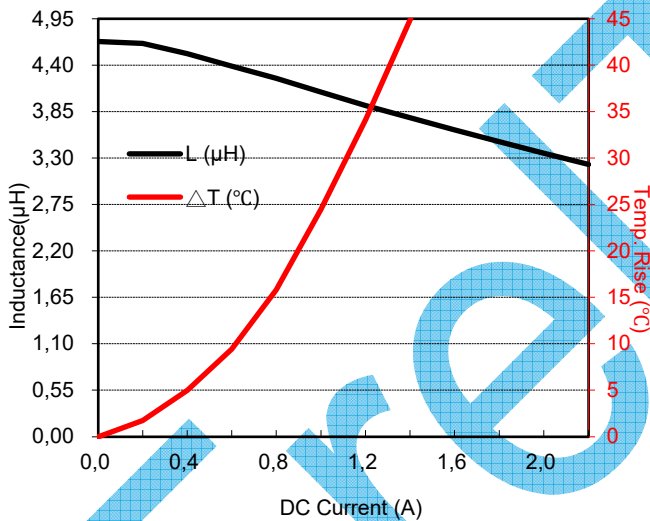
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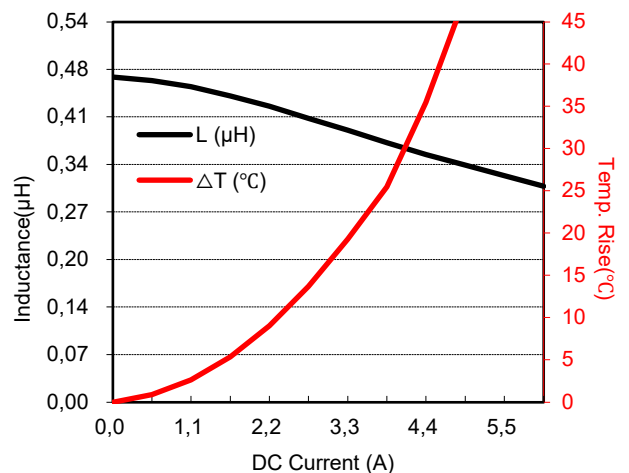
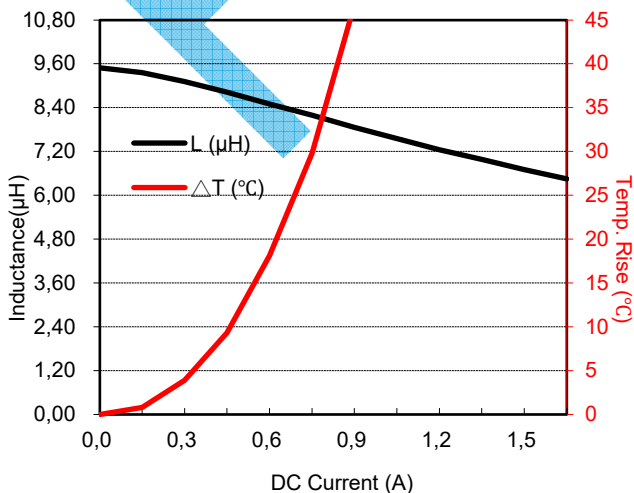
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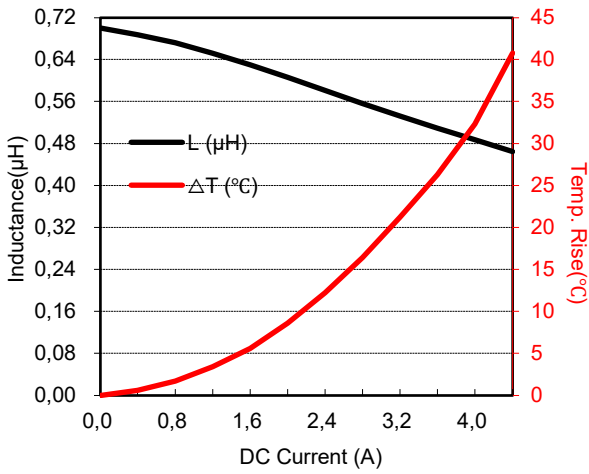
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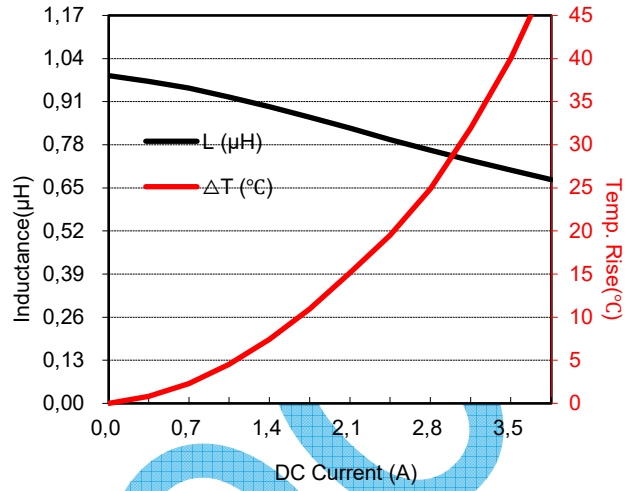
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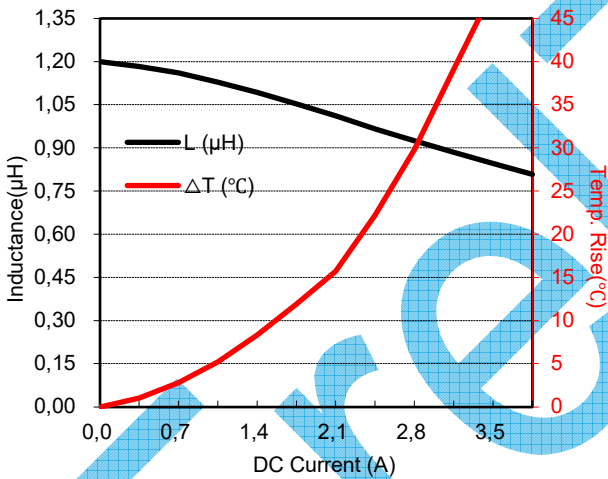


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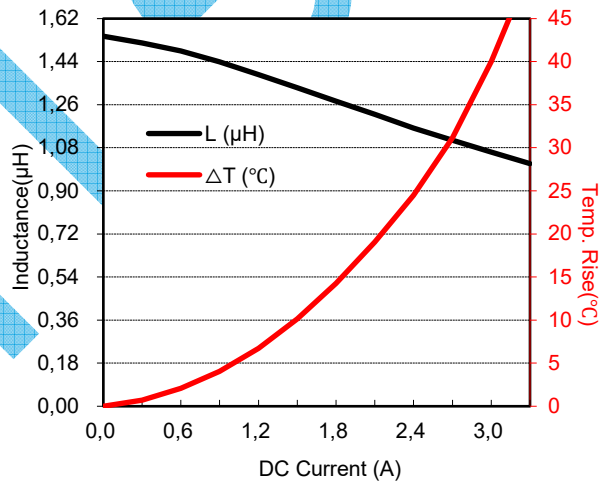
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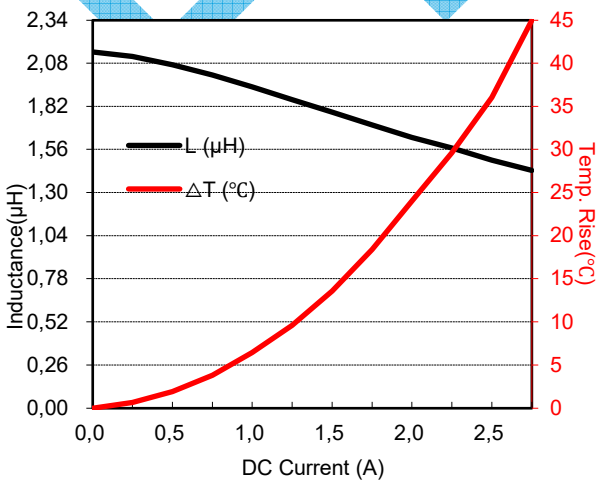
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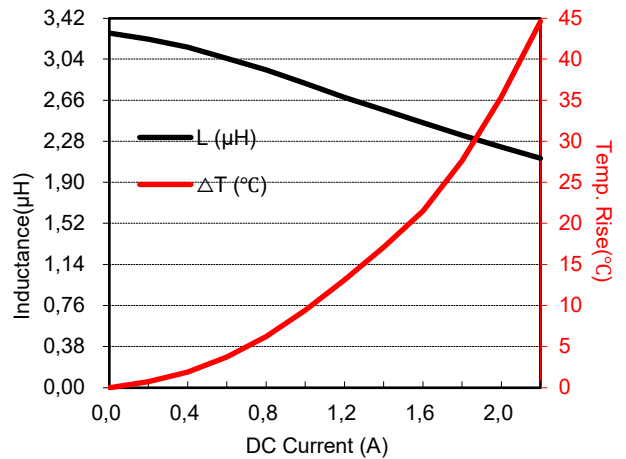
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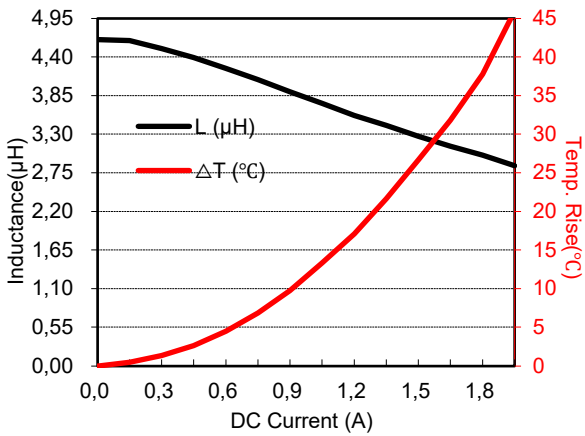


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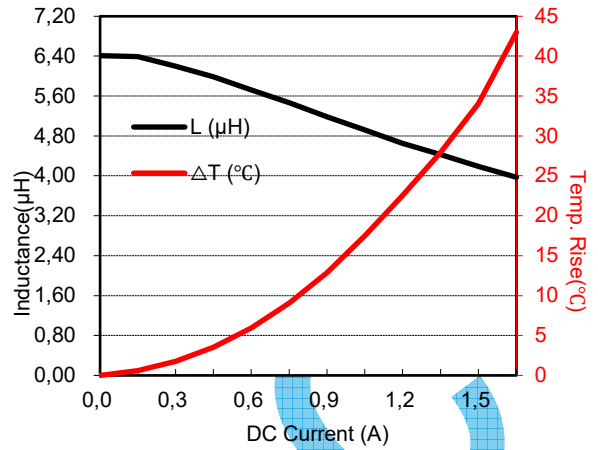
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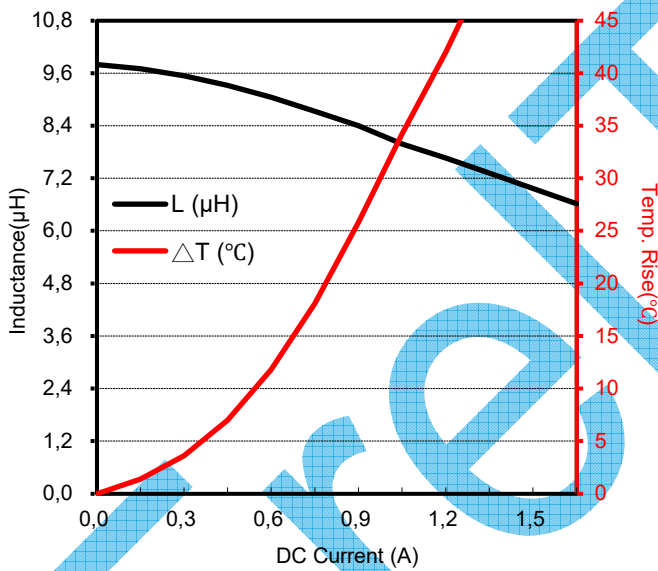


SMD Power Inductors

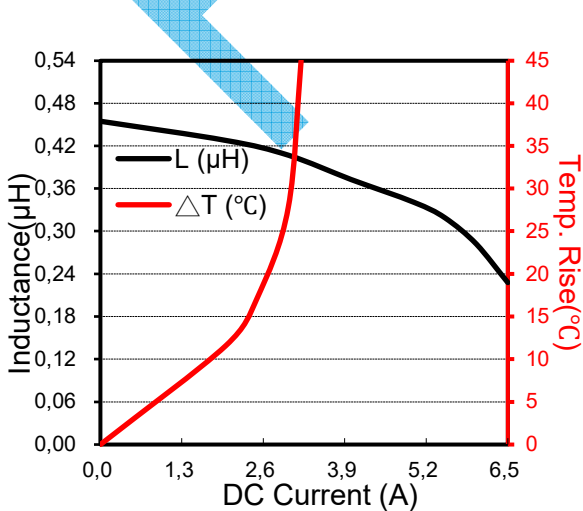
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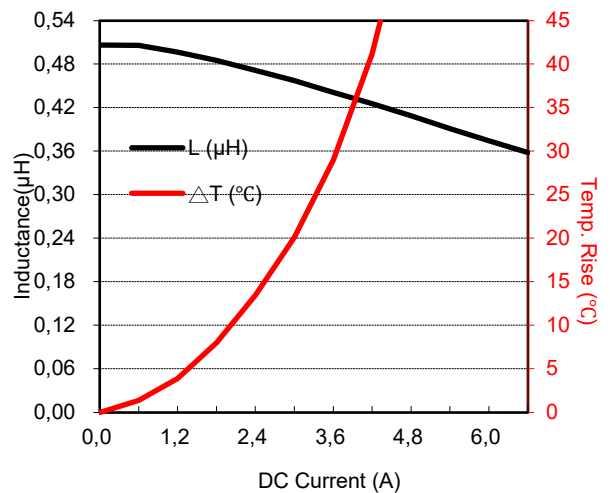
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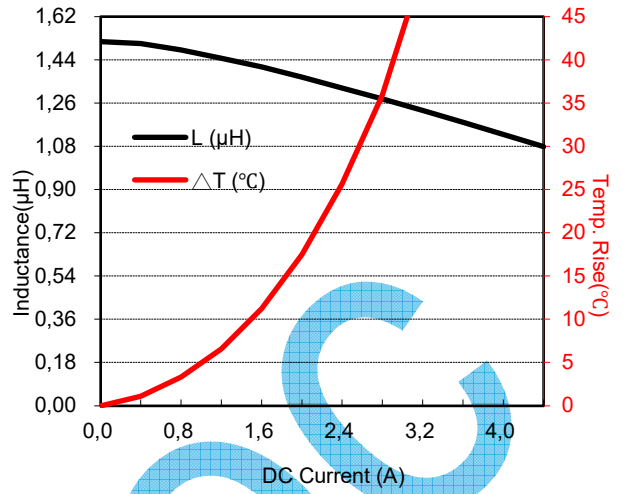
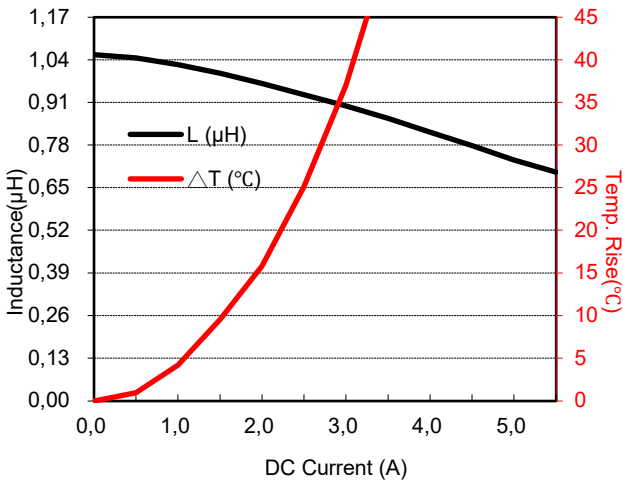


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SMD Power Inductors

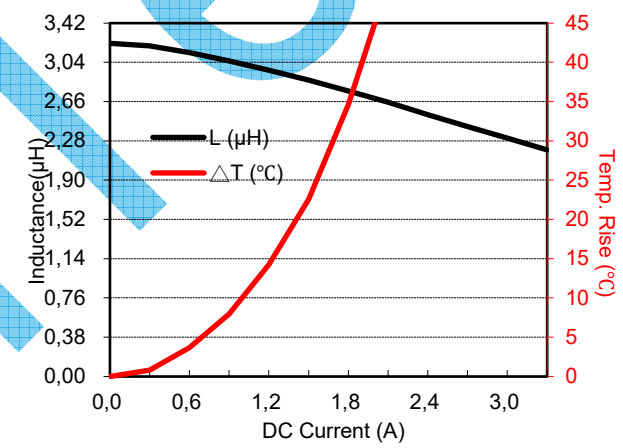
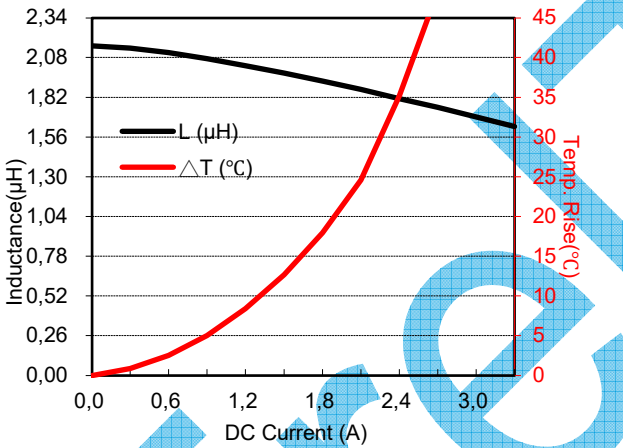
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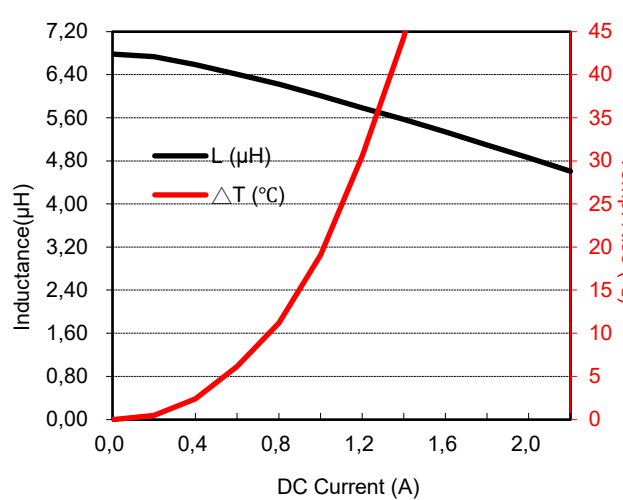
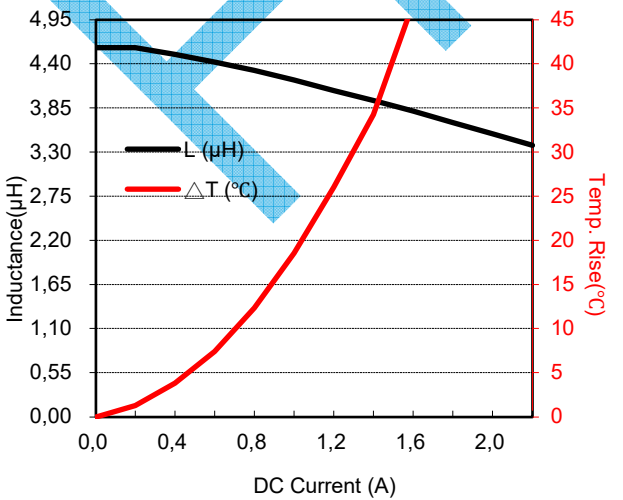
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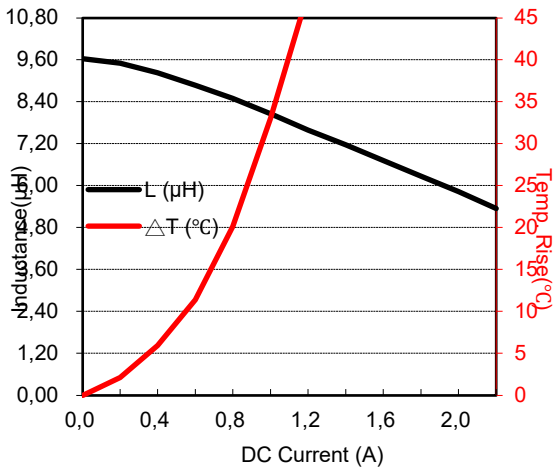
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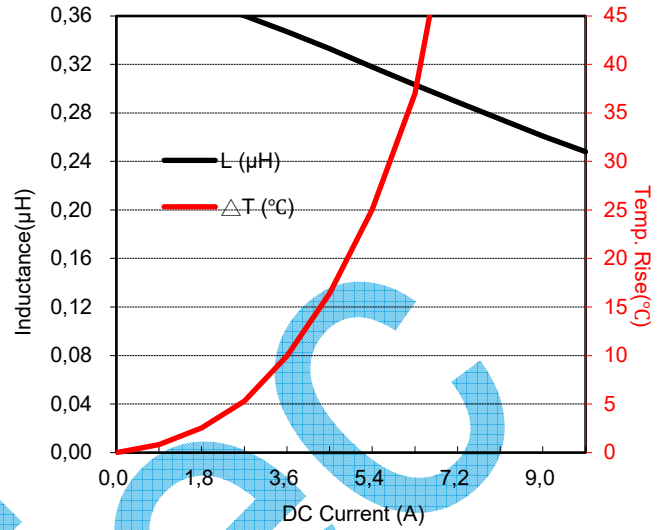
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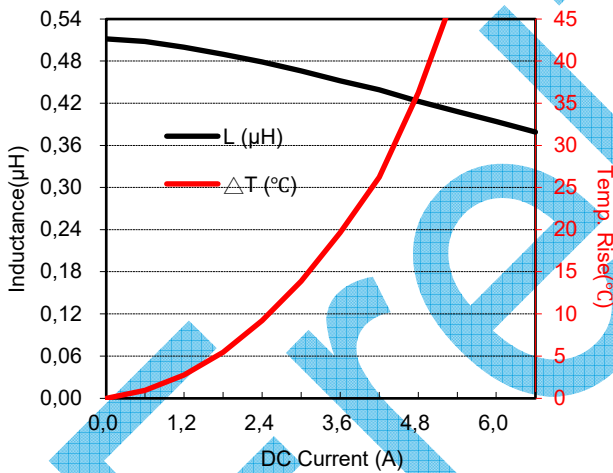


SMD Power Inductors

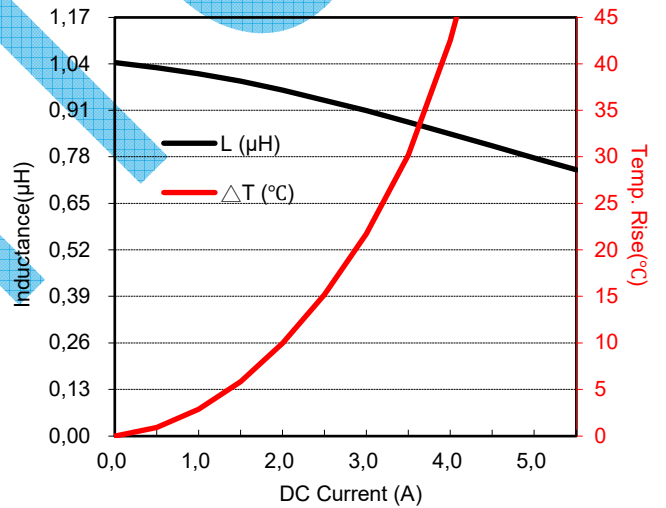
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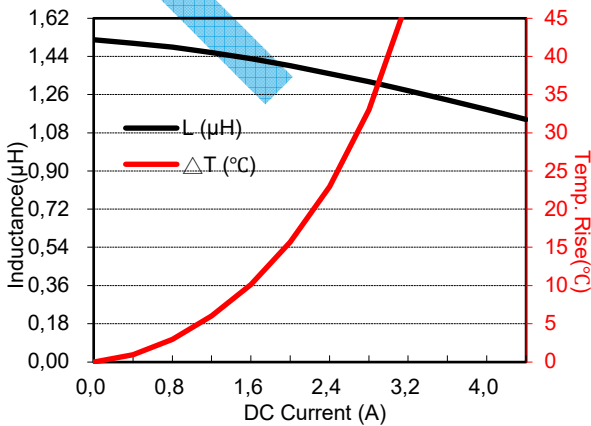
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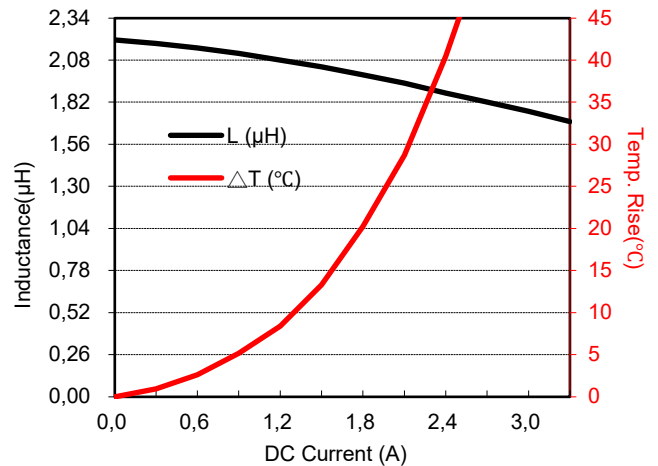
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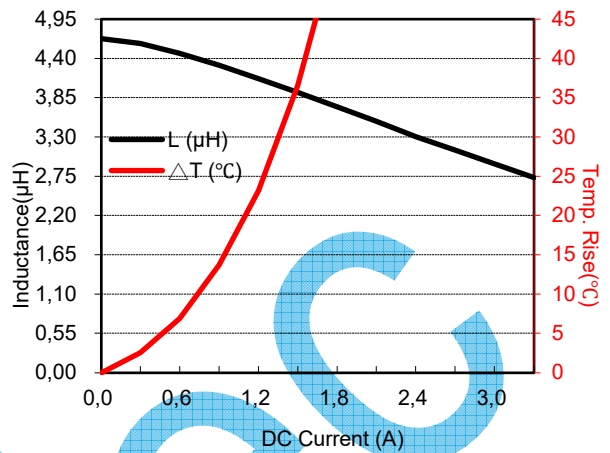
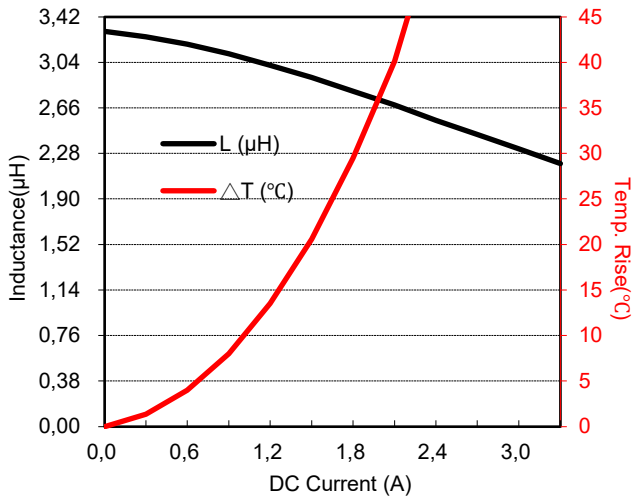


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SMD Power Inductors

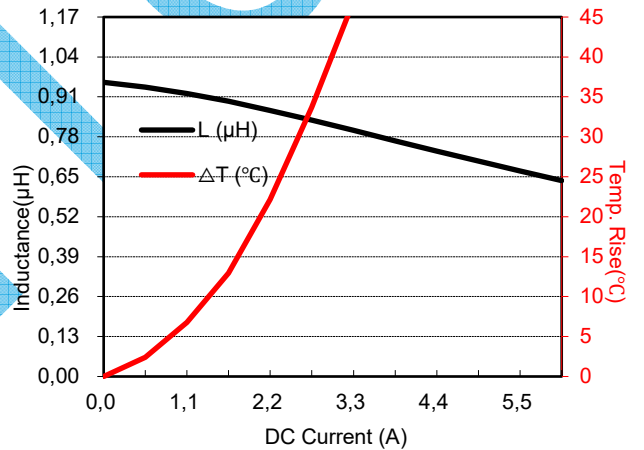
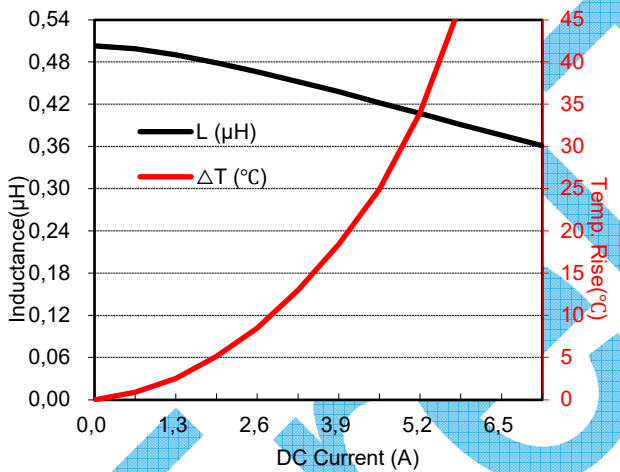
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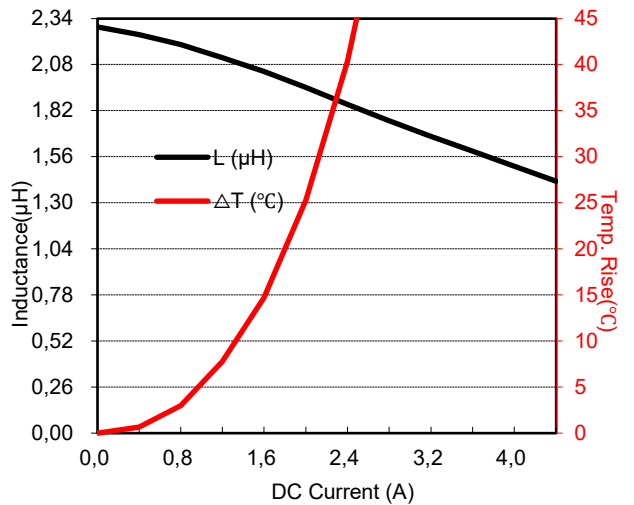
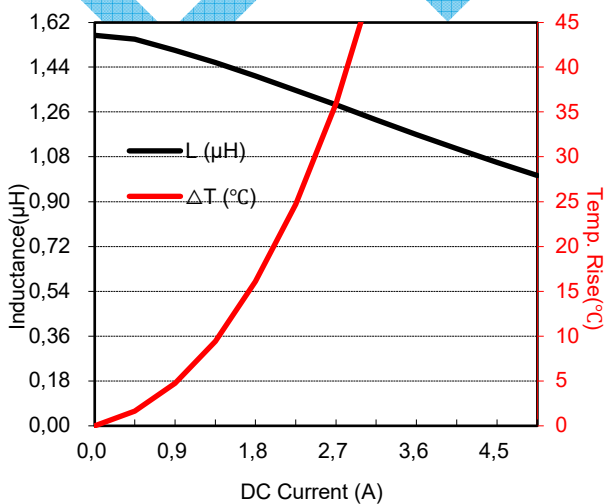
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15340401U5HME01A:

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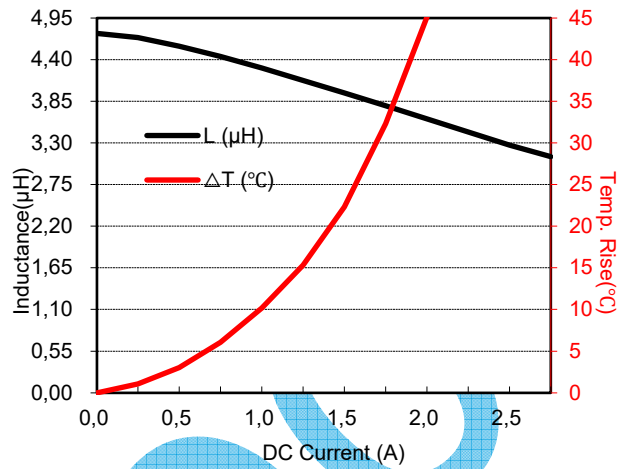
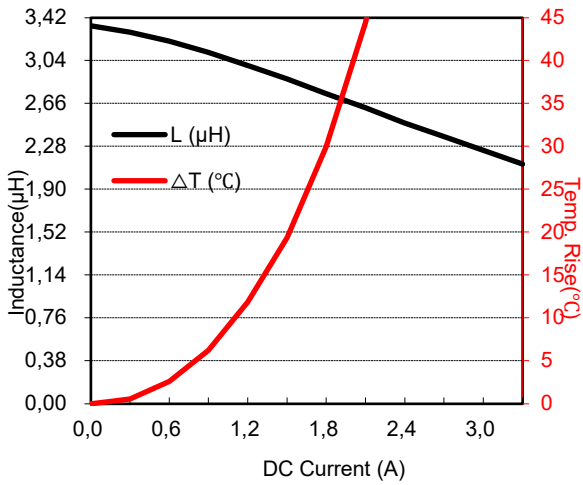


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SMD Power Inductors

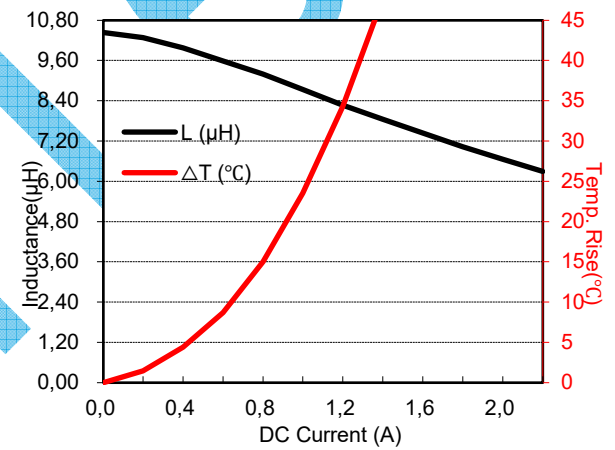
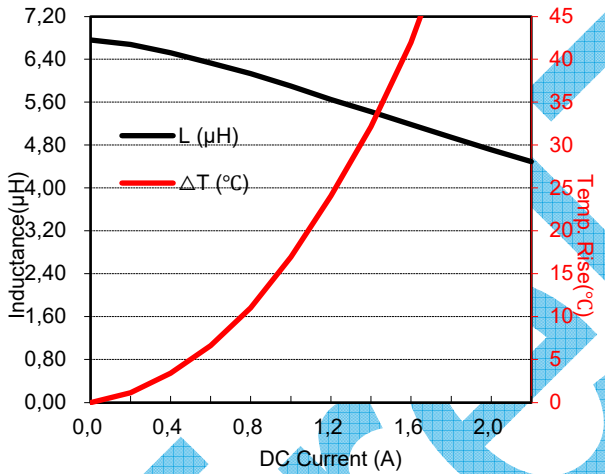
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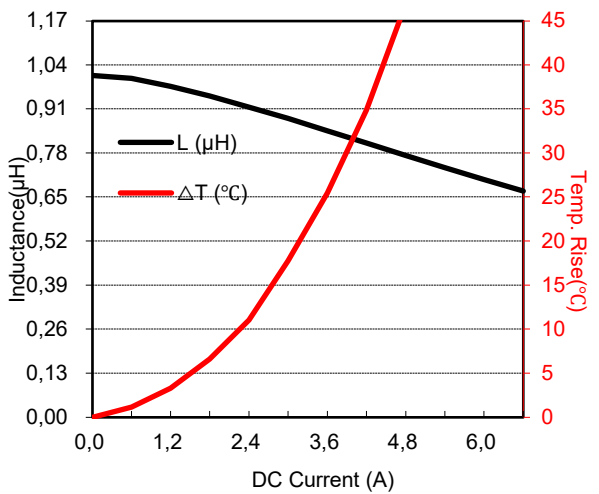
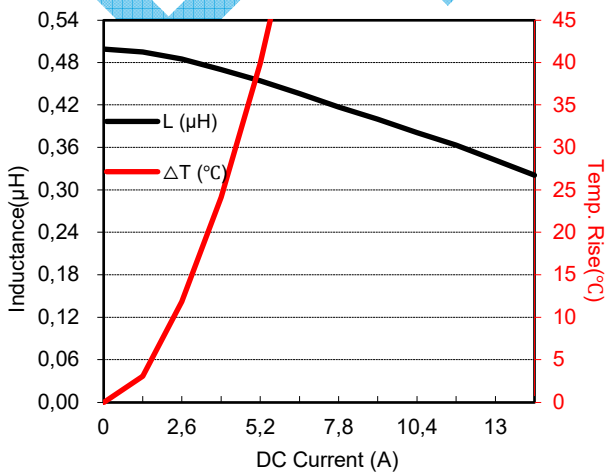
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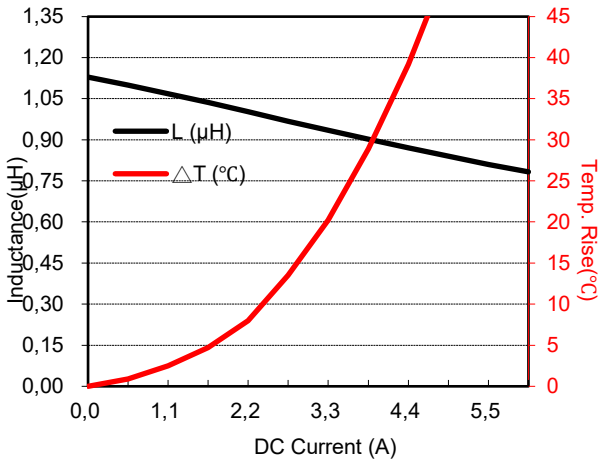
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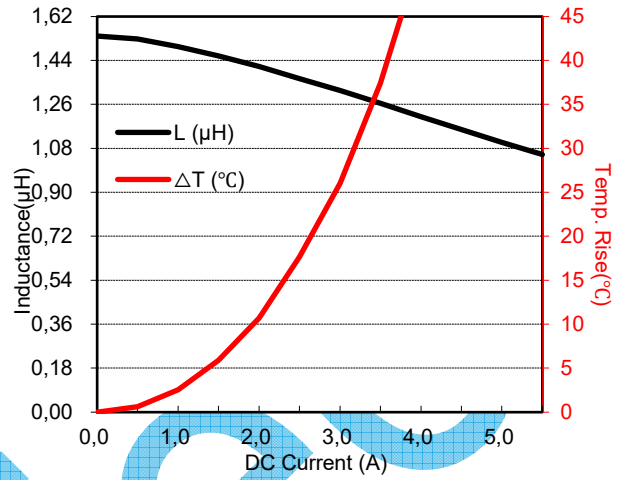
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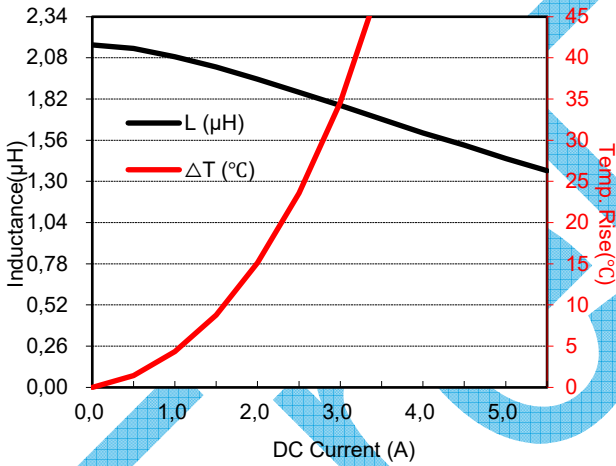


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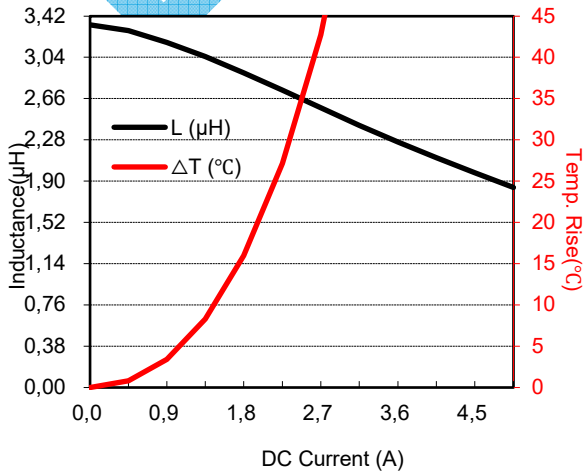
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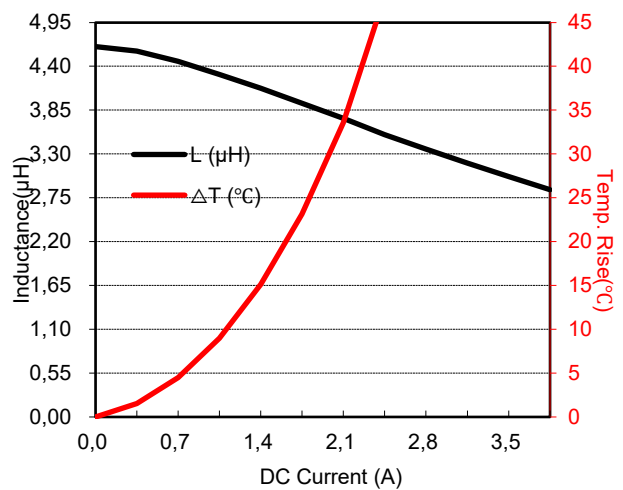
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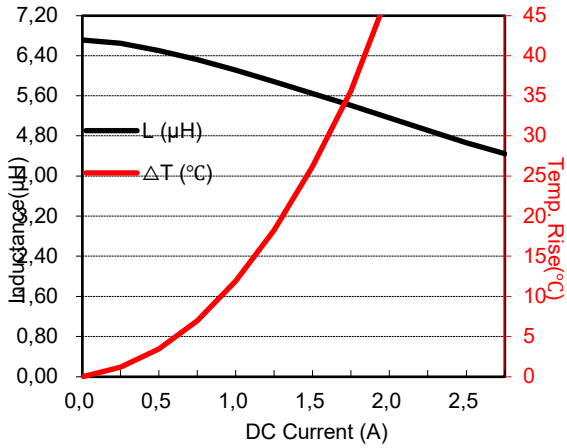


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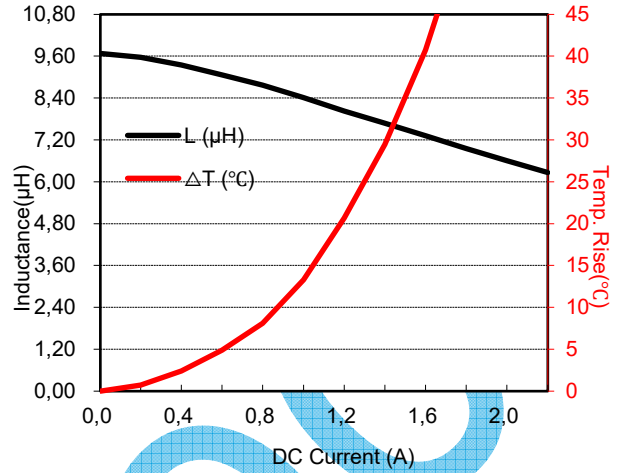
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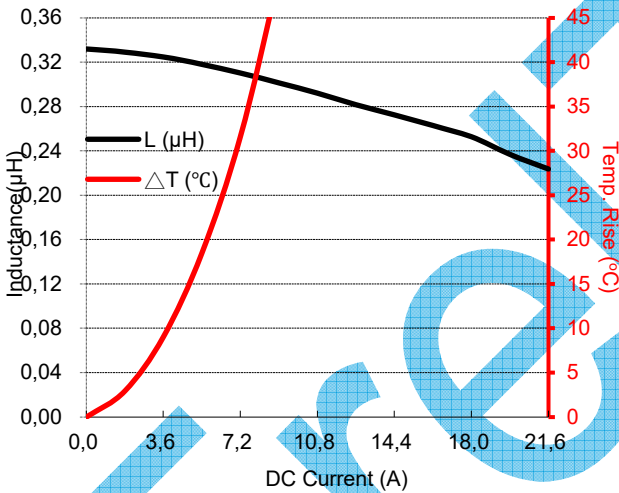


SMD Power Inductors

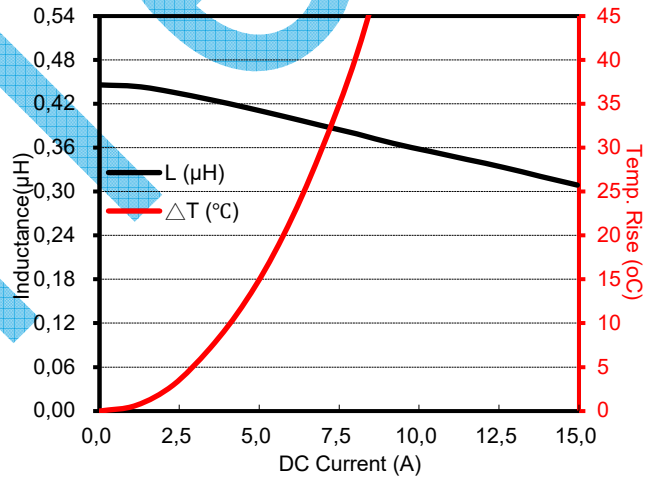
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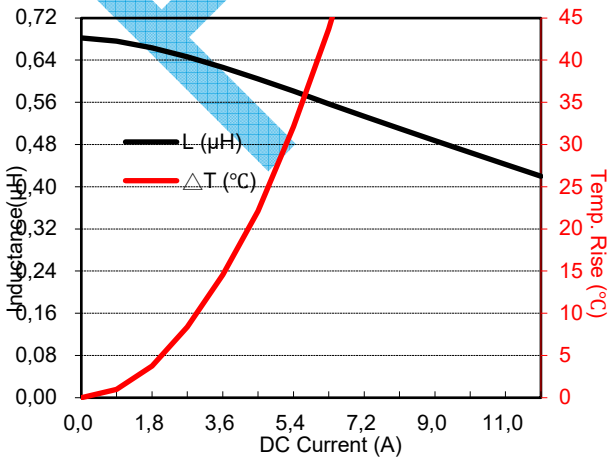
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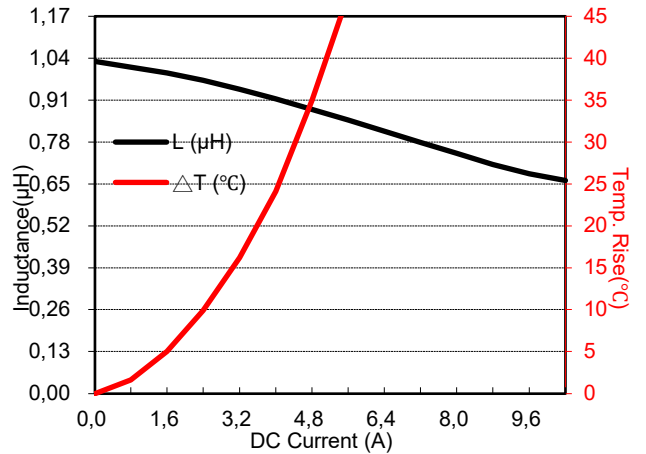
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1534141U68HMEY7H:



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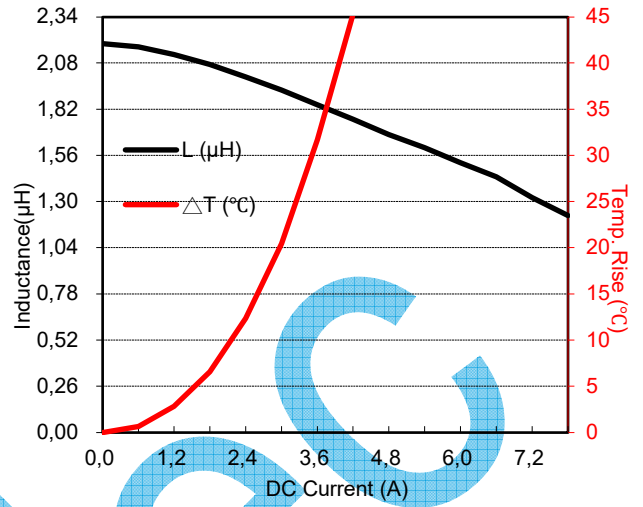
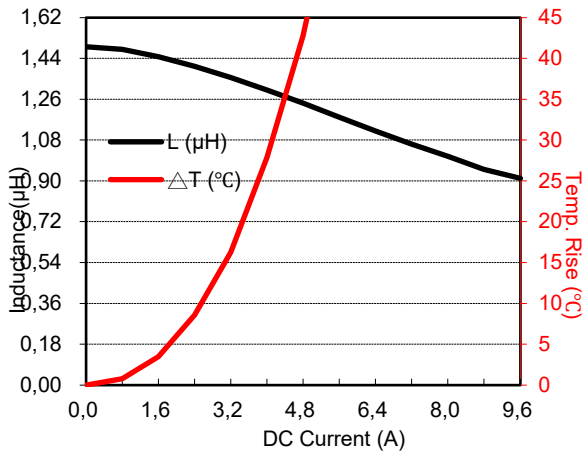


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SMD Power Inductors

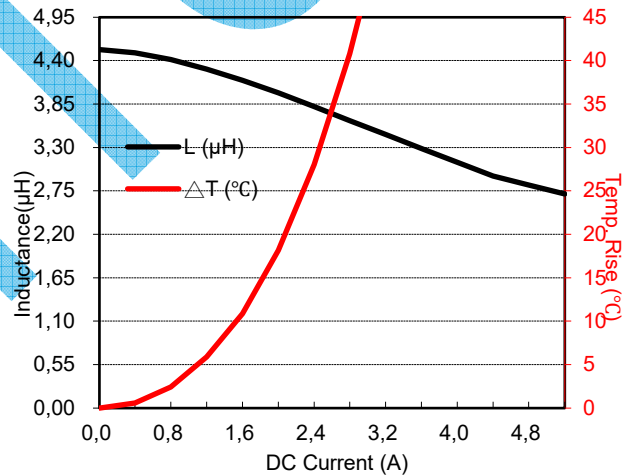
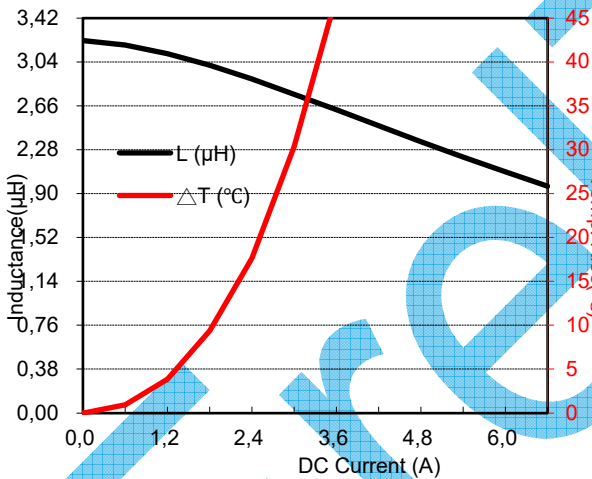
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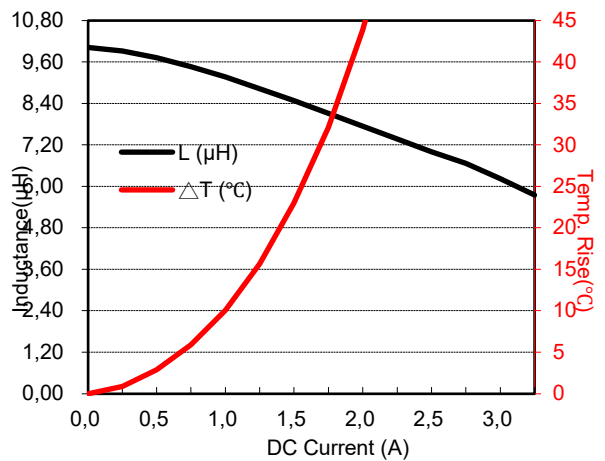
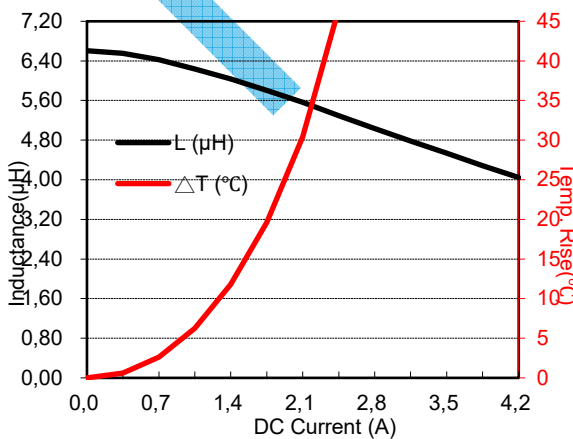
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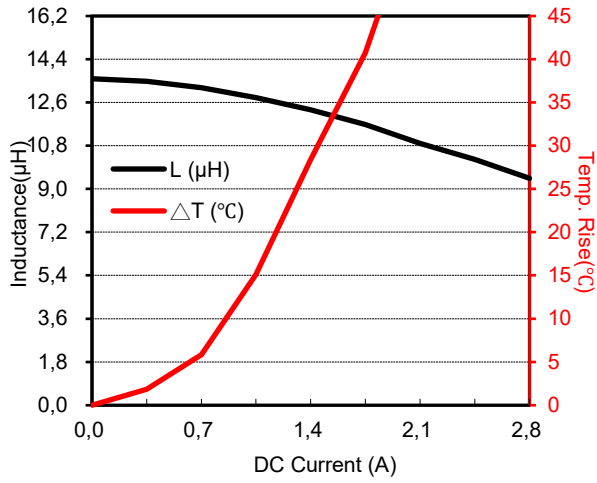
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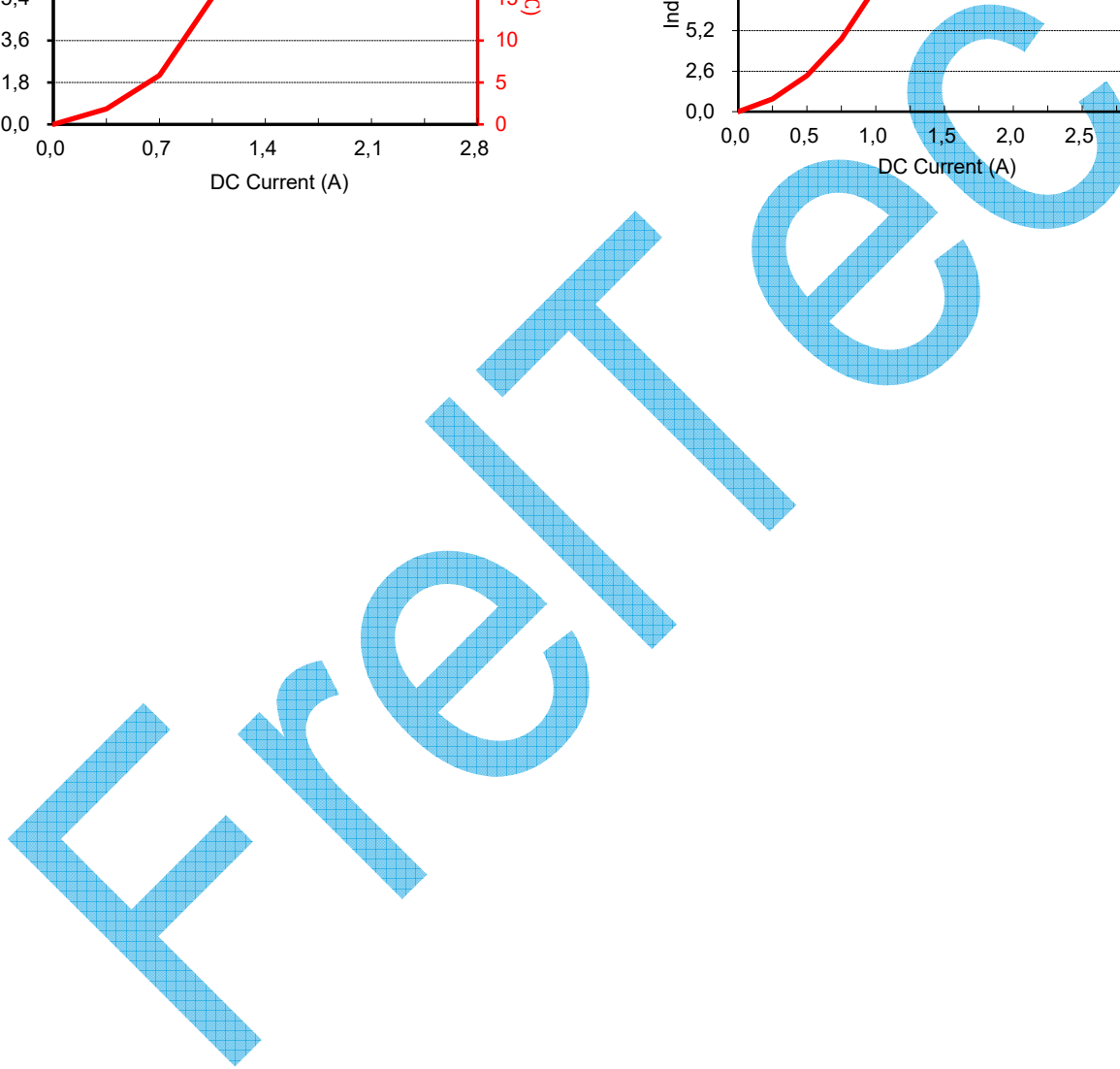
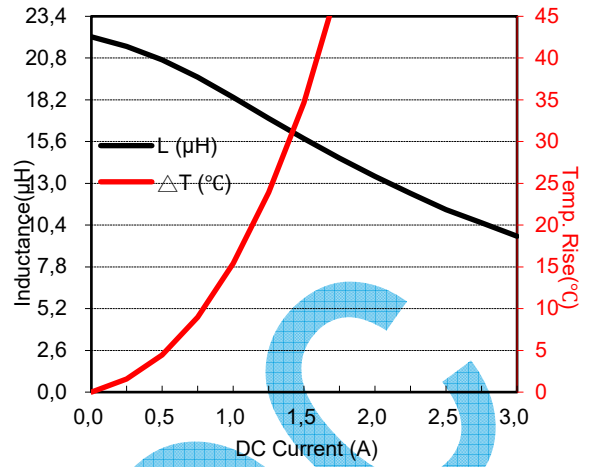
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SMD Power Inductors

153414122UHMEY7H:



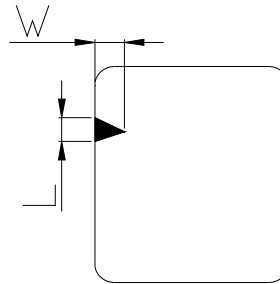
SMD

Appearance definition

Core chipping:

The appearance standard of the chipping size in top side, of bottom side ferrite core is following dimension.

	L	W
2016 2520	0,5mm Max	0,5mm Max
3030	0,6mm Max	0,6mm Max
4040 4141	1,0mm Max	1,0mm Max

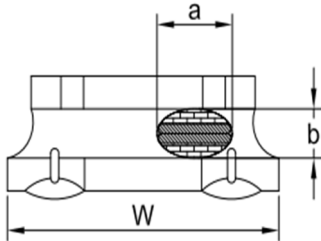


Void appearance tolerance limit only

2016 and 2520

Size of voids occurring to coating resin is specified below.

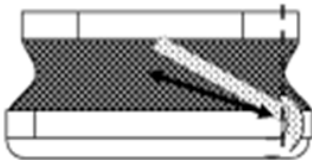
- 1) Width direction (i.e. a): Acceptable when $a \leq w/2$
Nonconforming when $a > w/2$
- 2) Length direction (i.e. b): Dimension b is not specified.
- 3) When total area of voids (including one exposing coil) occurring to each sides is not greater than 50% of coating resin area, that is acceptable.



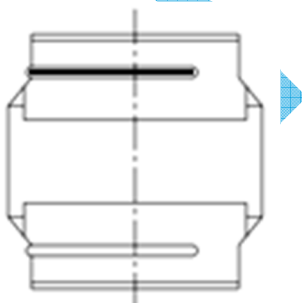
External appearance criterion for exposed wire

3030, 4040 and 4141

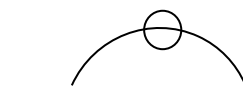
Exposed end of the winding wire at the secondary side should be 2mm and below.



Electrode appearance criterion for exposed wire



Cross section of wire joint part



Only top side wire is exposed.
(Regardless of whole top side of wire exposed)

Appearance judgment

less than 1/2 of joint side length is good.



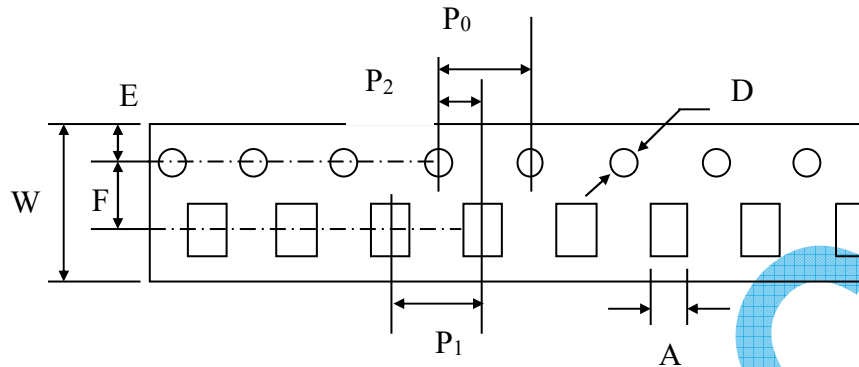
Wire is soldered insufficiently and less than half of outer diameter is covered with solder.

More than 1/2 is selected as defect

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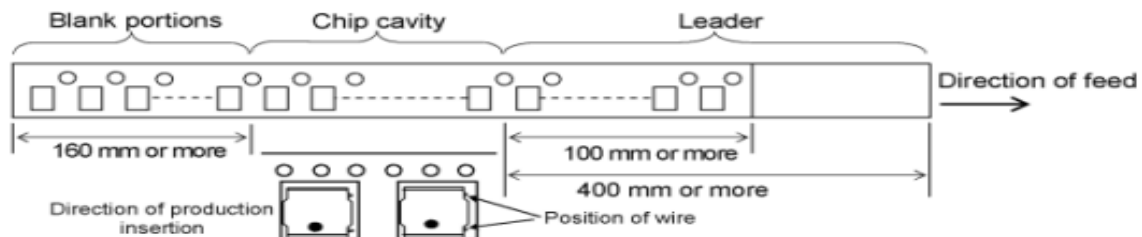
SPECIFICATION

Tape And Reel Package



Size	W	P ₁	F	A	E	P ₂	P ₀	D
1532016__H_E03A	8,0 ± 0,3	4,0 ± 0,3	3,5 ± 0,1	4 ± 0,1				
1532520__SME03A	8,0 ± 0,3	4,0 ± 0,3	3,5 ± 0,1	4 ± 0,1				
1532520__H_E03A	8,0 ± 0,3	4,0 ± 0,3	3,5 ± 0,1	4 ± 0,1				
1532520__H_E03C	8,0 ± 0,3	4,0 ± 0,3	3,5 ± 0,1	4 ± 0,1				
1533030__HME02A	8,0 ± 0,3	4,0 ± 0,3	3,5 ± 0,1	4 ± 0,1	1,75 ± 0,2	2,0 ± 0,1	4 ± 0,1	1,50 +0,1/-0
1532520__HME03A	8,0 ± 0,3	4,0 ± 0,3	3,5 ± 0,1	4 ± 0,1				
1534141__H_EY7H	12,0 ± 0,3	8,0 ± 0,3	5,5 ± 0,1	4 ± 0,1				
1533030__HME02C	8,0 ± 0,3	4,0 ± 0,3	3,5 ± 0,1	4 ± 0,1				
1534040__HME01A	12,0 ± 0,3	8,0 ± 0,3	5,5 ± 0,1	4 ± 0,1				
1534040__HME01C	12,0 ± 0,3	8,0 ± 0,3	5,5 ± 0,1	4 ± 0,1				

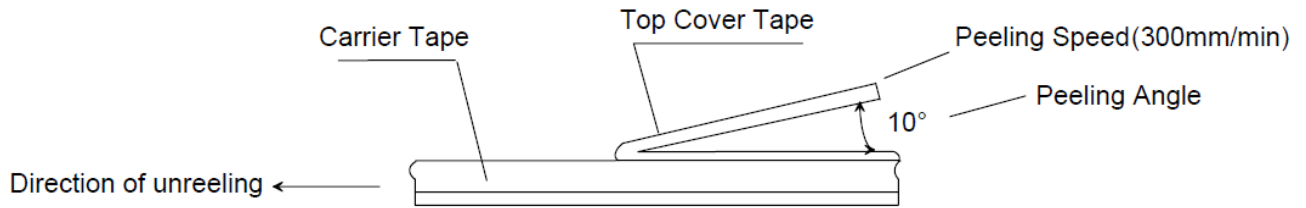
Lead Dimensions:



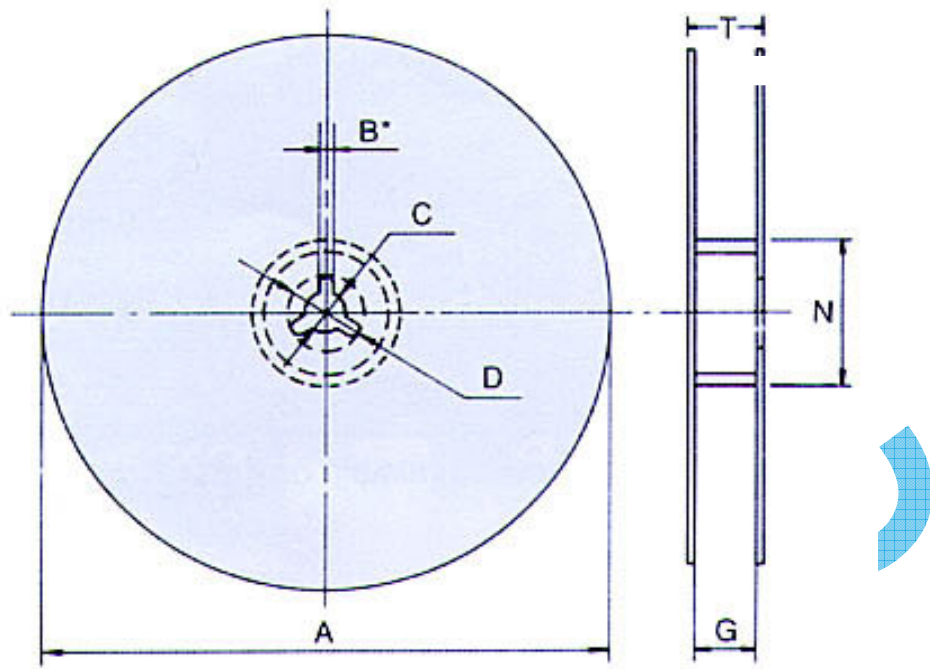
Cover Tape Peel off Strength

Specifications: 0,1N~1,3 N

Angle of between 165 and 180 degrees with the top of the carries tape. The cover tape, shall be pulled with a velocity of 300 mm minute.



FrelTec



Symbol	Reel Type / Tape	A	N	C	D	B	G	T
Dimension	153	180±20	60,0±15	13,0±0,5	21,0±0,8	2,0±0,5	8,4 ^{+0,2} _{-0,1}	12,4±2,0
	Only 1534040 1534141						12,4 ^{+0,2} _{-0,1}	17,0±2,0

in mm

FrelTec

SMD

SMD Power Inductors

Stock period

The performance of these products, including the solderability, is guaranteed for 12 months after production date code, provided that they remain packed as they were when delivered and stored at a temperature of 5°C to 35°C and a relative humidity less than 45 to 70%RH

Handling:

Keep the products away from all magnets and magnetic objects.

Be careful not to subject the products to excessive mechanical shocks.

Please avoid applying impact to the products after mounted on pc board.

Avoid ultrasonic cleaning

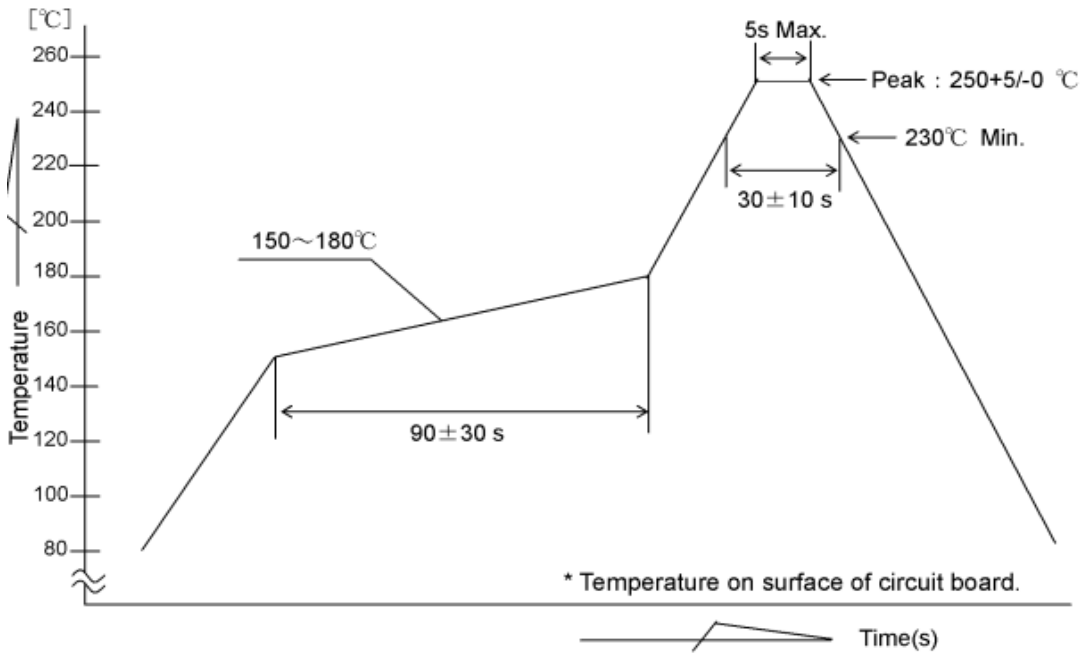
FrelTec

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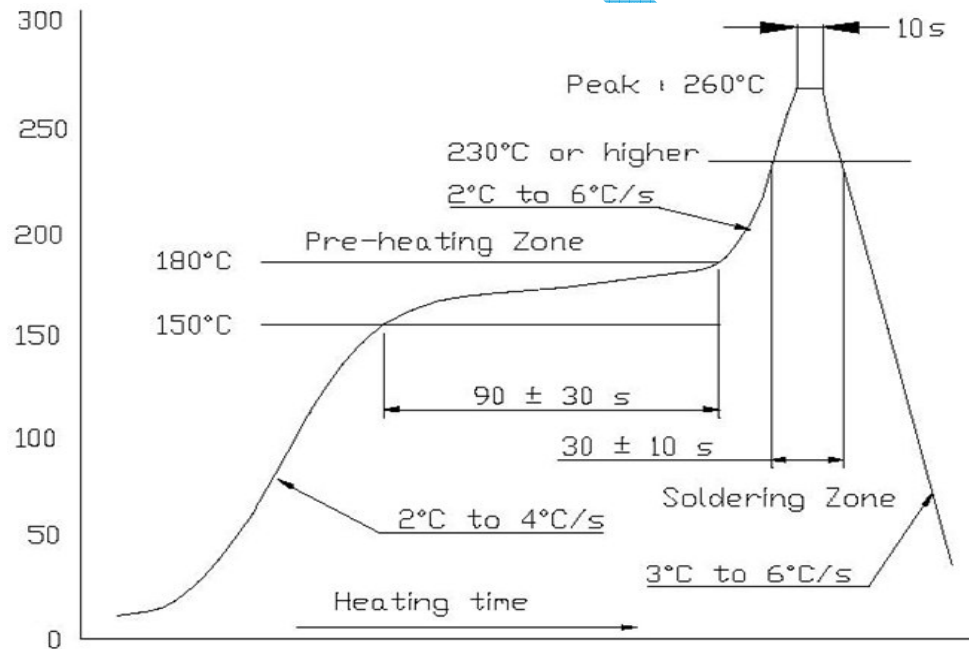
SMD Power Inductors

Reflow Soldering Profile

1532520__SME03A, 1533030__HME02A, 1534040__HME01A:



All other this:



SMD

Reliability Test

Mechanical

Item	Specification & Requirement	Test Method
Solder ability	The surface of terminal immersed shall be minimum of 90% covered with a new coating of solder	Solder heat proof: 1. Preheating: 160±10°C 90s 2. Retention time: 245±5°C for 3 ± 1 sec
Vibration	No mechanical damage. Inductance change within±10%.	1. Frequency: 10Hz to 55Hz to 10Hz in 60 sec as a period 2. Vibration time: period cycled for 2 hours in each of 3 mutual perpendicular directions 3. Amplitude: 1,5mm max.
Terminal strength	No detachment of terminal pin and no breakage of wire	Add static load 4,9N (500gf) to inductor through hole of test board for 10 ± 2 sec

Endurance

Item	Specification & Requirement	Test Method
Thermal Shock	No mechanical damage. Inductance change within±10%.	1. Repeat 100 cycles as follow : -40°C ± 2°C, 30±3 minutes Room temperature, 5 minutes +125°C ± 2°C, 30±3 minutes Room temperature, 5 minutes 2. Recovery: 48+4/-0 hours of recovery under the standard condition after the test see note
High Temperature resistance	No mechanical damage. Inductance change within±10%.	1. Environment condition: 85°C±2°C Applied Current: Rated current 2. Duration : 500 +4/-0 hours see note
Humidity resistance	No mechanical damage. Inductance change within±10%.	1. Environment condition: 60°C±2°C Humidity : 90~95% Applied Current: Rated current 2. Duration : 500 +4/-0 hours see note
Low Temperature Storage	No mechanical damage. Inductance change within±10%.	1. Store temperature: -40°C ± 2°C 2. Duration: 500 +4/-0 hours
High Temperature Storage	No mechanical damage. Inductance change within±10%.	1. Store temperature: +125°C ± 2°C 2. Duration: 500 +4/-0 hours

Note:

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

Published by FrelTec® GmbH
Mathildenstr. 10A; 82319 Starnberg; Germany
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