Coiltronics MPI5451 Series

High current, low profile power inductors

Product description

- Halogen free, lead free, RoHS compliant
- 125°C maximum total temperature operation
- 5.74 x 5.43 footprint surface mount package with either 1.2 or 2.0mm heights
- Magnetically shielded, low EMI
- Rugged construction
- Inductance range from 0.33µH to 15µH
- Current range from 1.1 to 11.5 amps

Applications

- Handheld/mobile devices
- Portable media players
- MP3 Players
- Battery operated devices
- Notebook/netbook
- Tablets/smartbooks
- LCD Displays
- LED Drivers

Environmental data

- Storage temperature range (Component): -40°C to +125°C
- Operating temperature range: -40°C to +125°C (ambient + self-temperature rise)
- Solder reflow temperature: J-STD-020D compliant

Packaging

- Supplied in tape and reel packaging on a 13" diameter reel

The Coiltronics brand of magnetics (formerly of the Bussmann Division of Cooper Industries) is now part of Eaton's Electrical Group, Electronics Division.

Coiltronics is now part of Eaton
Same great products plus even more.

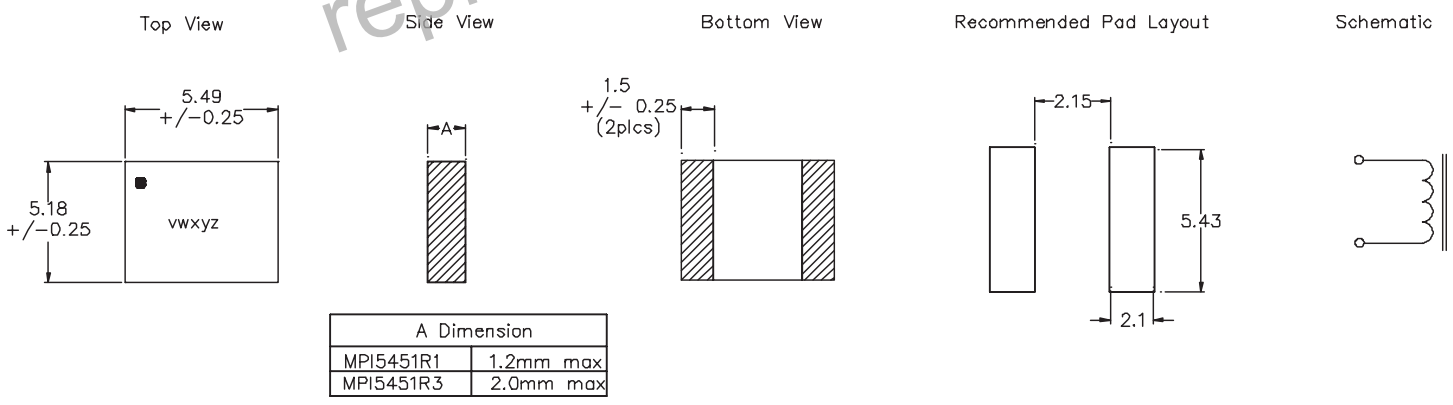
Powering Business Worldwide

Product specifications

Part Number[5]	OCL[1] (µH) ± 20%	I_{rms}[2] (Amps)	I_{sat}[3] (Amps)	DCR (mΩ) @ 25°C ± 20%	K-Factor[4]
R1 - 1.2mm height					
MPI5451R1-R33-R	0.33	6.5	11.5	13	1244
MPI5451R1-R47-R	0.47	6.1	10.9	18	995
MPI5451R1-1R0-R	1.0	4.2	7.2	30	622
MPI5451R1-1R5-R	1.5	3.4	6.1	48	498
MPI5451R1-2R2-R	2.2 ± 15%	2.6	4.8	70	452
MPI5451R1-3R3-R	3.3 ± 15%	2.3	3.8	95	355
MPI5451R1-4R7-R	4.7 ± 15%	2.1	3.5	120	293
MPI5451R1-5R6-R	5.6 ± 15%	1.9	3.1	145	249
MPI5451R1-6R8-R	6.8 ± 15%	1.7	2.8	175	237
MPI5451R1-100-R	10.0 ± 15%	1.3	2.5	290	199
MPI5451R1-150-R	15.0 ± 15%	1.1	2.2	400	155
R3 - 2.0mm height					
MPI5451R3-R47-R	0.47	6.0	9.0	8.8	1244
MPI5451R3-R68-R	0.68	5.9	8.0	9.5	995
MPI5451R3-1R0-R	1.0	5.1	6.6	14	711
MPI5451R3-1R5-R	1.5	5.0	5.3	16	553
MPI5451R3-2R2-R	2.2	4.1	5.0	24	452
MPI5451R3-3R3-R	3.3	3.7	4.2	33	383
MPI5451R3-4R7-R	4.7	3.0	3.8	50	293
MPI5451R3-6R8-R	6.8	2.6	3.0	70	249
MPI5451R3-100-R	10.0	2.1	2.4	110	207

1. Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.1V_{rms}, 0.0Adc, 25°C
2. I_{rms}: DC current for an approximate temperature rise of 40°C without core loss. Derating is necessary for AC currents. PCB layout, trace thickness and width, air-flow, and proximity of other heat generating components will affect the temperature rise. It is recommended that the temperature of the part not exceed 125°C under worst case operating conditions verified in the end application.
3. I_{sat}: Peak current for approximately 20% rolloff at +25°C
4. K-factor: Used to determine B_{p-p} for core loss (see graph). B_{p-p} = K * L * ΔI. B_{p-p}:(Gauss), K: (K-factor from table), L: (Inductance in µH), ΔI (Peak to peak ripple current in Amps).
5. Part Number Definition: MPI5451Rx-yyy-R
   - MPI5451Rx = Product code and size
   - yyy= Inductance value in uH, R = decimal point, if no R is present then third character = number of zeros
   - "-R" suffix = RoHS compliant

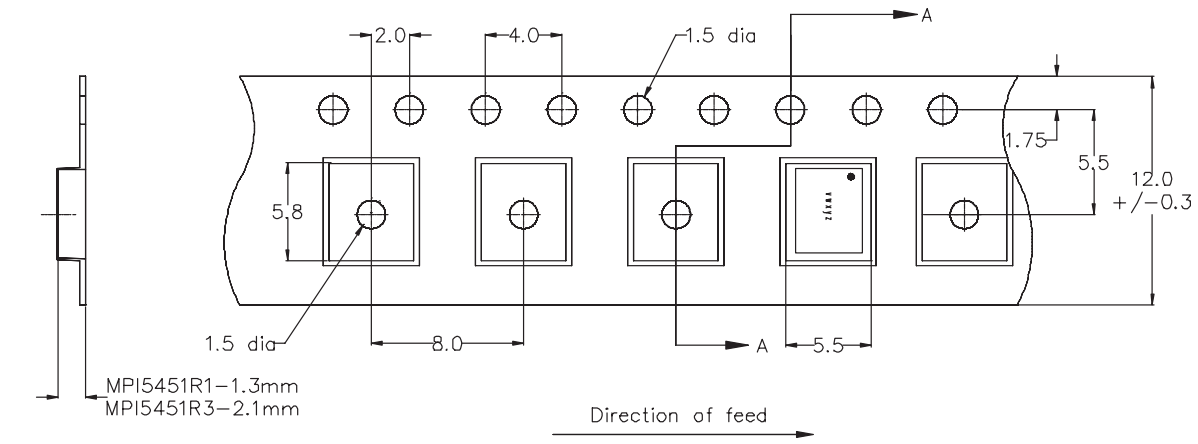
Dimensions - mm



A Dimension	
MPI5451R1	1.2mm max
MPI5451R3	2.0mm max

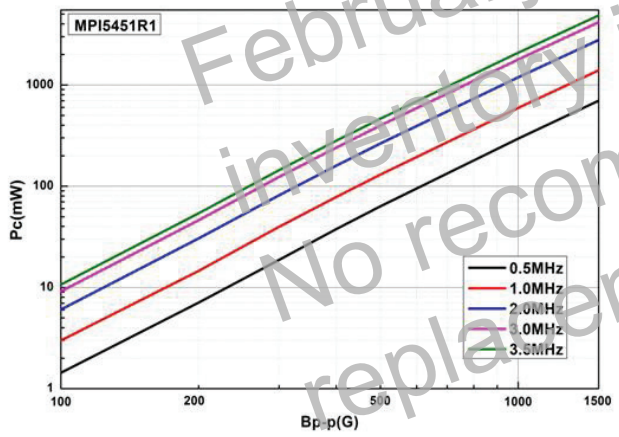
Part Marking : vwxyz
v = height: 1 = R1 (1.2mm), 3 = R3 (2.0mm)
w = inductance value per the "Part Marking Designator" letter code in table above
x = Bi-weekly date code
y = Last digit of year manufactured
z = Revision level

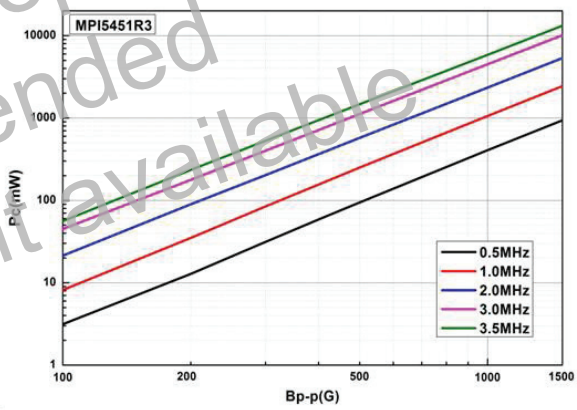
Packaging information - mm



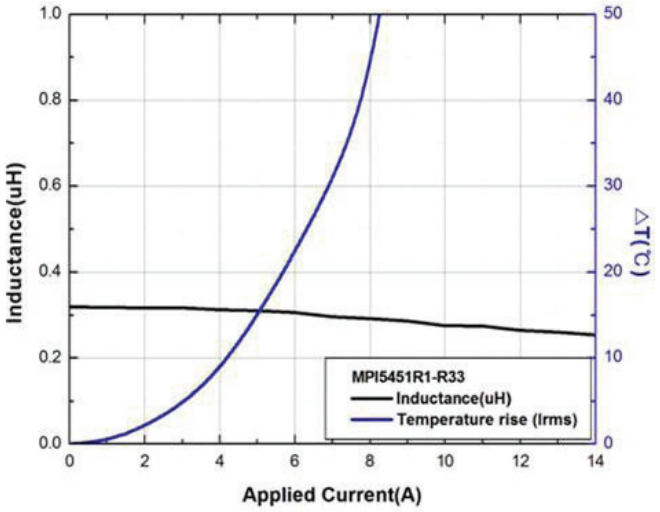
Supplied in tape and reel packaging,
MPI5451R1 4000 parts per 13” diameter reel
MPI5451R3 3000 parts per 13” diameter reel

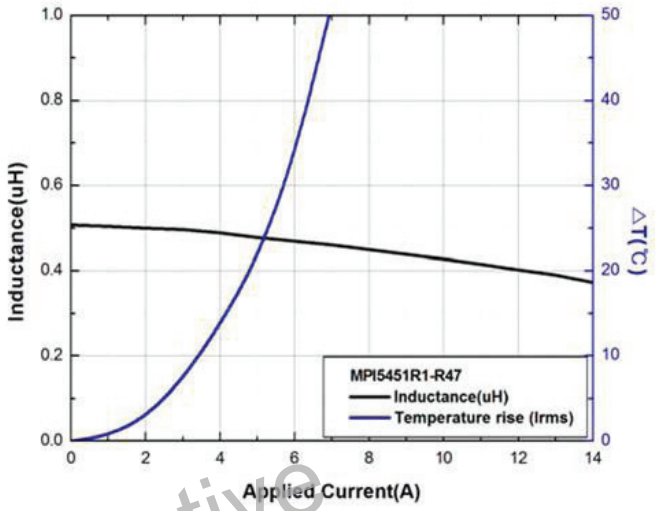
Core loss

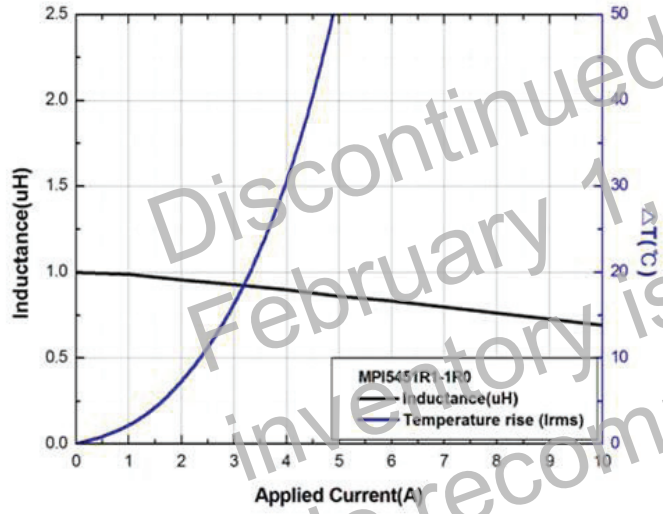


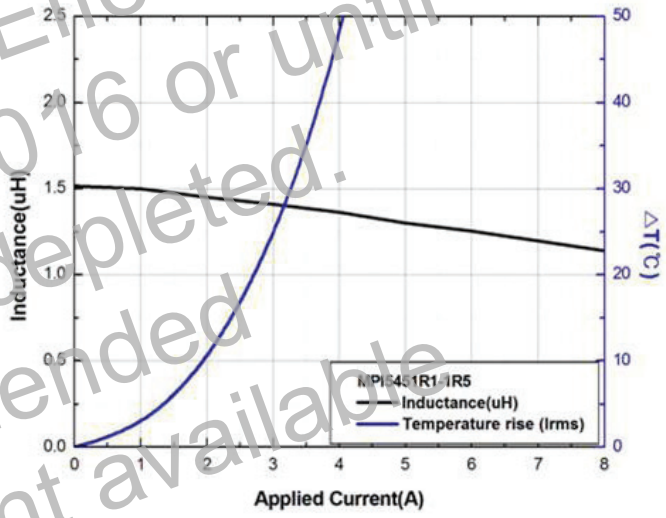


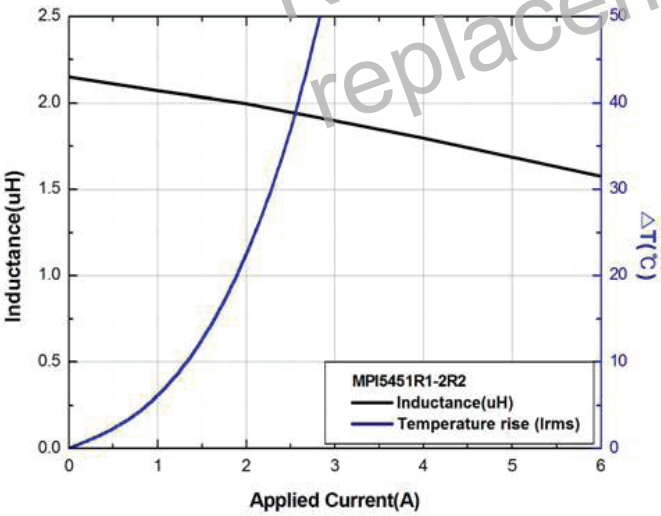
Inductance characteristics / temperature rise

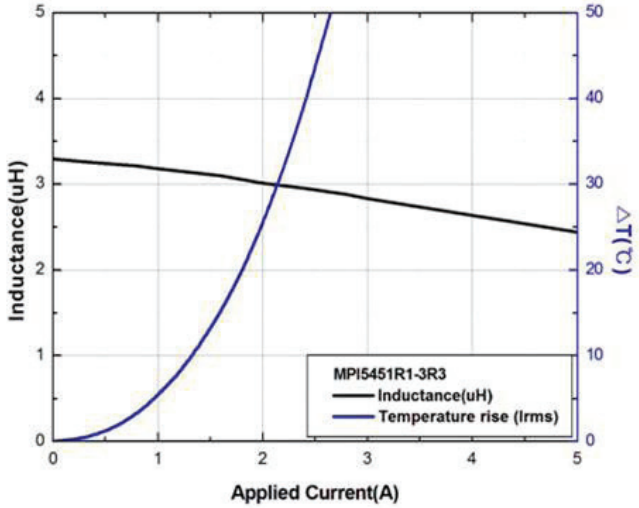












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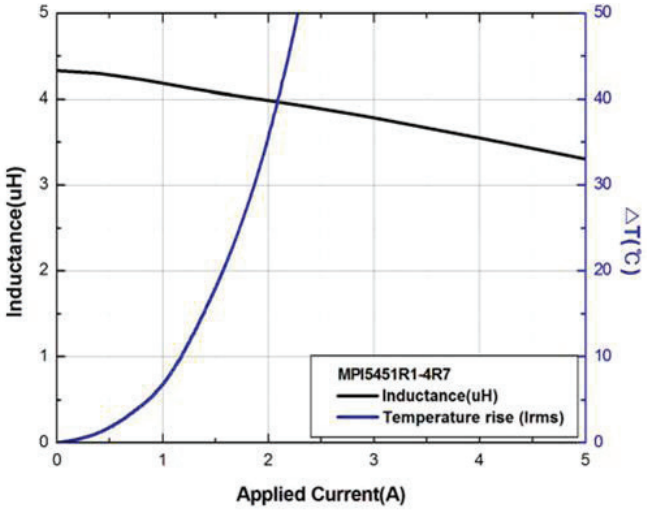

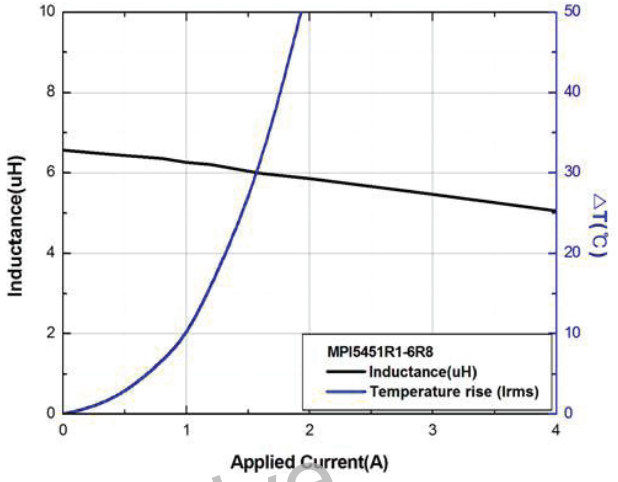

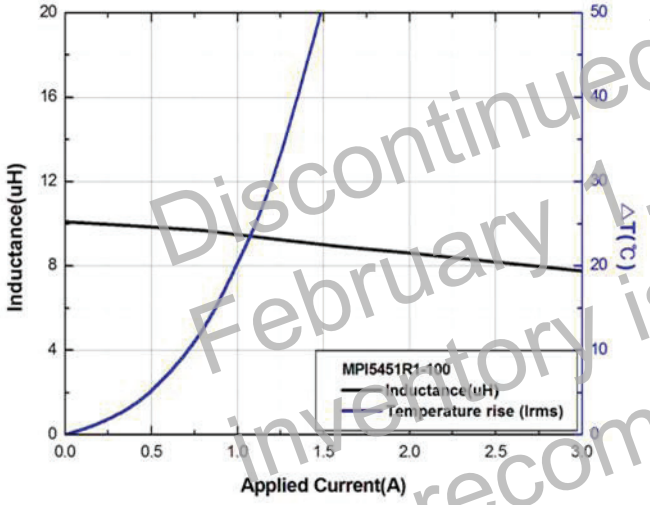

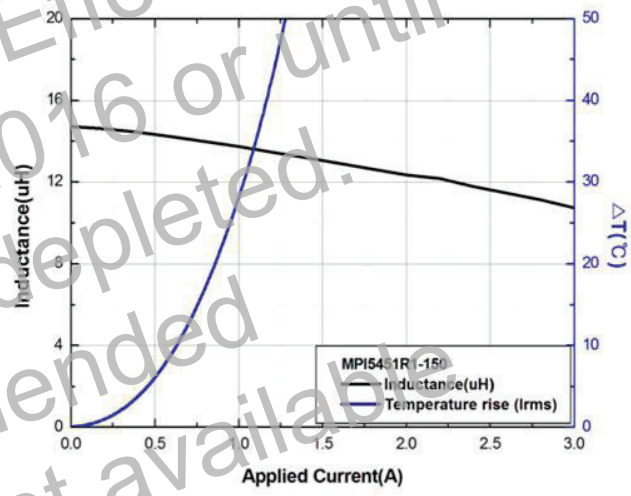

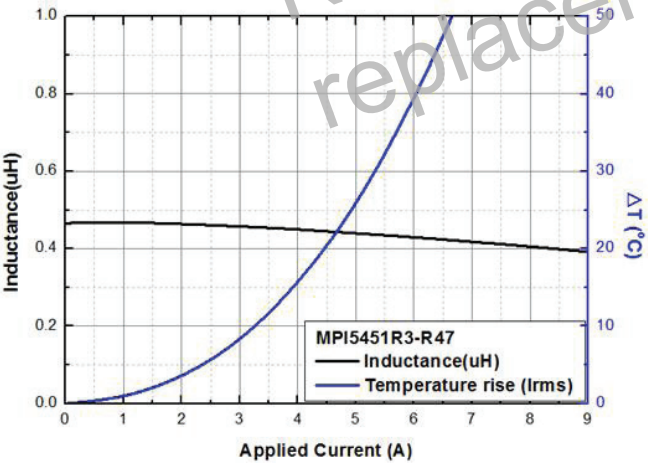

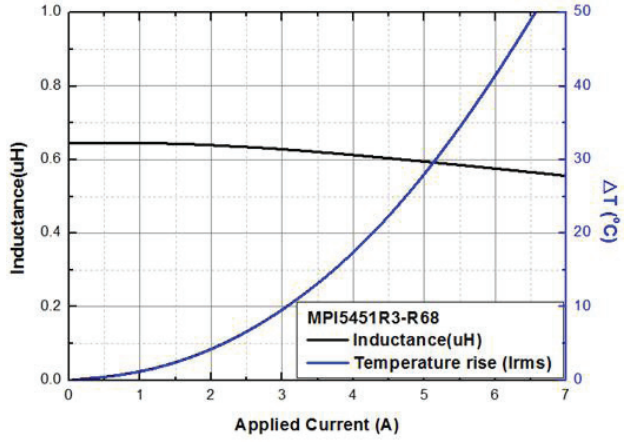

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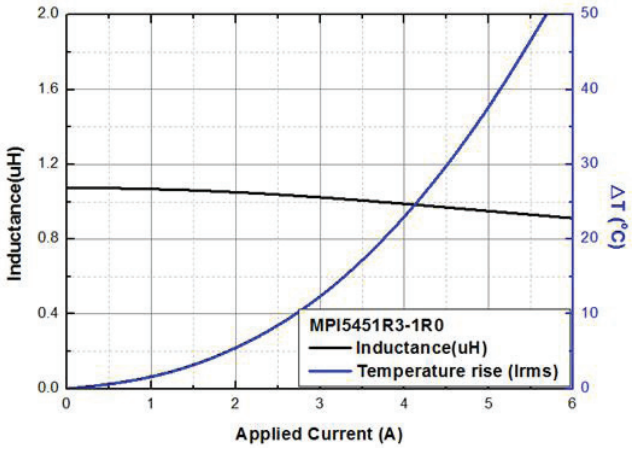
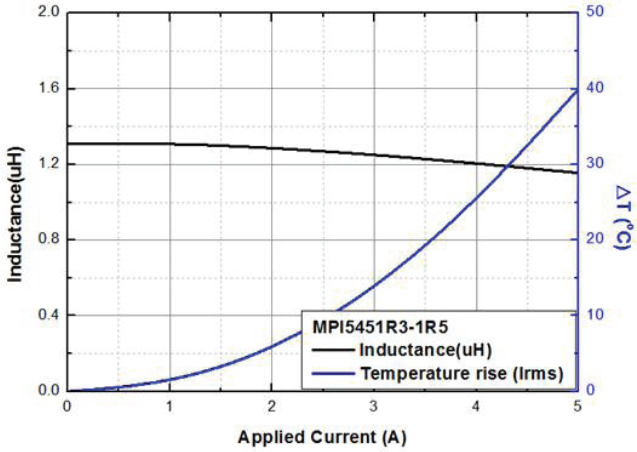
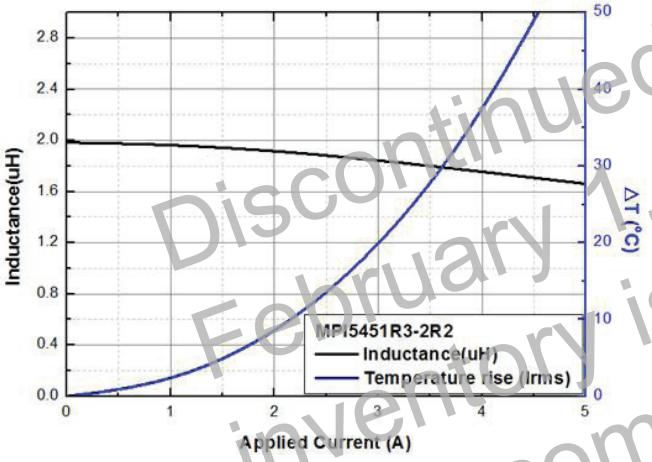
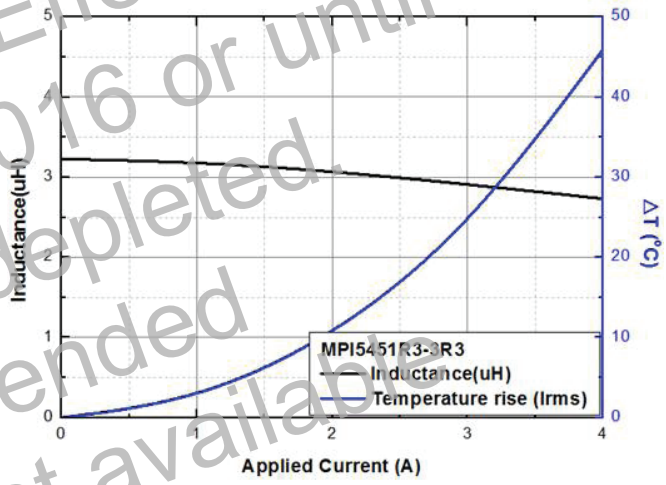
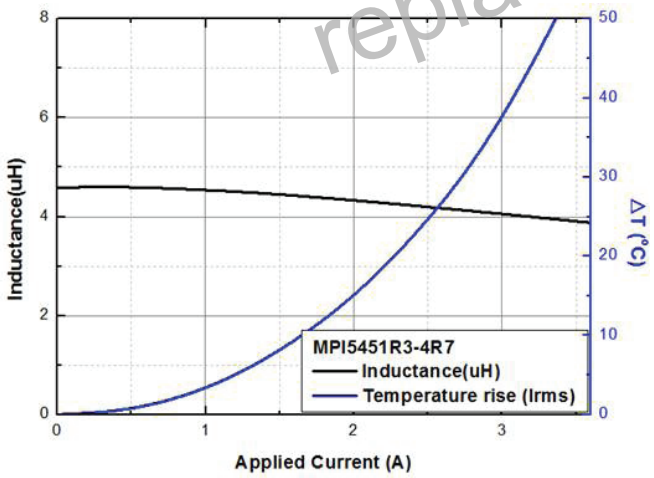
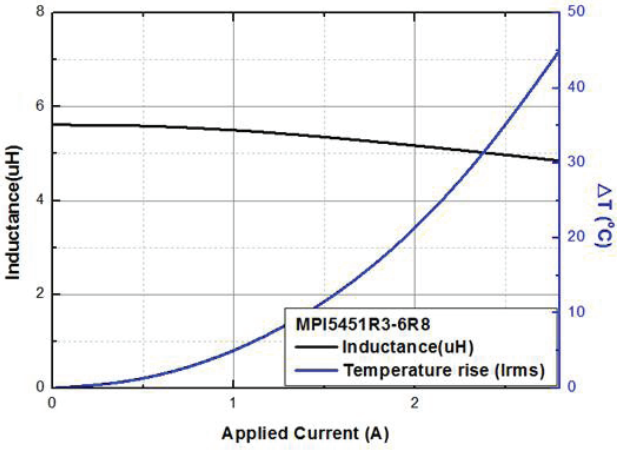




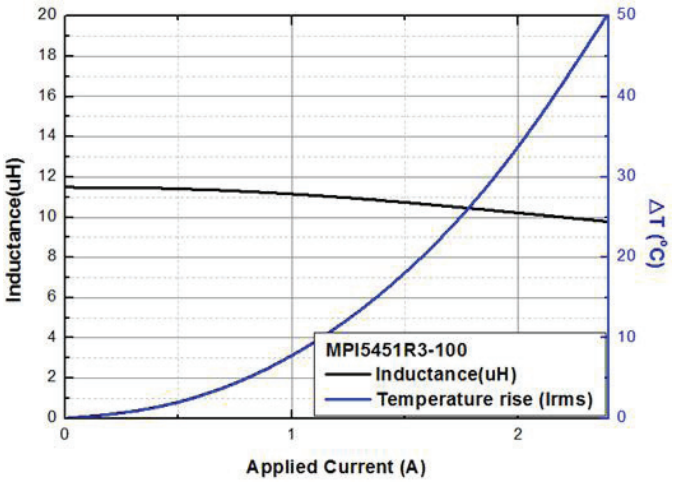








Inductance characteristics / temperature rise



Solder reflow profile

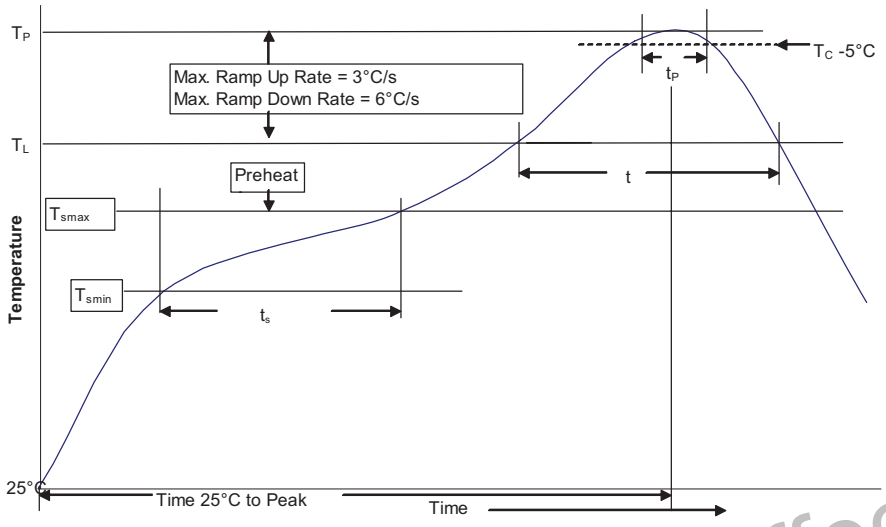


Table 1 - Standard SnPb Solder (T_C)

Package Thickness	Volume mm³ <350	Volume mm³ ≥350
<2.5mm	235°C	220°C
≥2.5mm	220°C	220°C

Table 2 - Lead (Pb) Free Solder (T_C)

Package Thickness	Volume mm³ <350	Volume mm³ 350 - 2000	Volume mm³ >2000
<1.6mm	260°C	260°C	260°C
1.6 – 2.5mm	260°C	250°C	245°C
>2.5mm	250°C	245°C	245°C

Reference JDEC J-STD-020D

Profile Feature		Standard SnPb Solder	Lead (Pb) Free Solder
Preheat and Soak	• Temperature min. (T_{smin})	100°C	150°C
	• Temperature max. (T_{smax})	150°C	200°C
	• Time (T_{smin} to T_{smax}) (t_S)	60-120 Seconds	60-120 Seconds
Average ramp up rate (T_{smax} to T_p)		3°C/ Second Max.	3°C/ Second Max.
Liquidous temperature (T_L) Time at liquidous (t_L)		183°C 60-150 Seconds	217°C 60-150 Seconds
Peak package body temperature (T_P)		Table 1	Table 2
Time (t_p)** within 5 °C of the specified classification temperature (T_C)		20 Seconds**	30 Seconds**
Average ramp-down rate (T_p to T_{smax})		6°C/ Second Max.	6°C/ Second Max.
Time 25°C to Peak Temperature		6 Minutes Max.	8 Minutes Max.

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

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

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