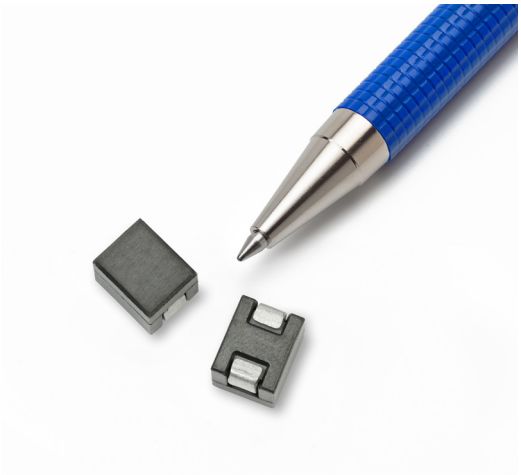
FP1008R4

High frequency, high current power inductors



Product features

- High current carrying capacity
- Low core loss
- Magnetically shielded
- Inductance Range from 150 nH to 180 nH
- Current range from 56 A to 72 A
- 10.8 mm x 8.2 mm footprint surface mount package in an 8.2 mm height
- Moisture Sensitivity Level: 1
- Ferrite core material

Applications

- Multi-phase and Vcore regulators
- Voltage Regulator Modules (VRMs) and High power density VRMs
  - Server and desktop
  - Central processing unit (CPU)
  - Graphics processing unit (GPU)
  - Application specific integrated circuit (ASIC)
- Data networking and storage systems
- Graphics cards and battery power systems
- Point-of-Load modules (POL)

Environmental data

- Storage temperature range (Component): -40 °C to +125 °C
- Operating temperature range: -40 °C to +125 °C (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020 (latest revision) compliant
- Halogen free, lead free, RoHS compliant

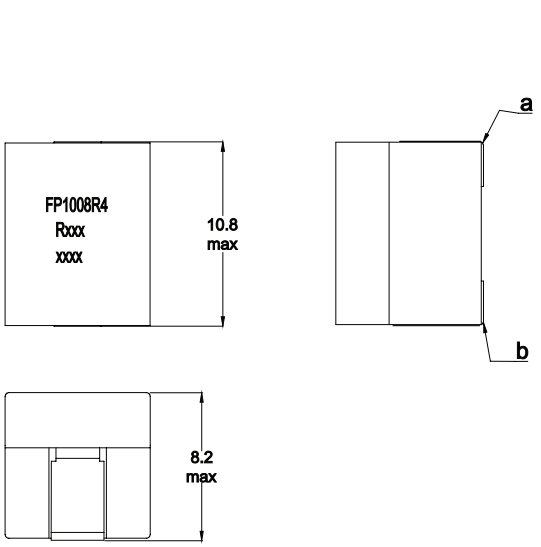
Powering Business Worldwide

Product specifications

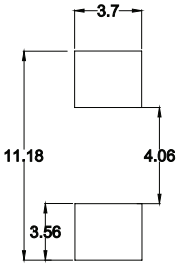
Part Number[8]	OCL[1] (nH) ±10%	FLL[2] (nH) minimum	I_{rms}[3] (A)	$I_{sat}1$[4] (A)	$I_{sat}2$[5] (A)	$I_{sat}3$[6] (A)	DCR (mΩ) ±8% @ 20°C	K-factor[7]
FP1008R4-R150-R	150	105	70	72	56	52	0.125	375.5
FP1008R4-R180-R	180	130	70	56	44	40	0.125	375.5

1. Open Circuit Inductance (OCL) Test Parameters: 100 kHz, 0.1 Vrms, 0.0 Adc, +25 °C
2. Full Load Inductance (FLL) Test Parameters: 100 kHz, 0.1 Vrms, $I_{sat}1$, +25 °C
3. 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.
4. $I_{sat}1$: Peak current for approximately 20% rolloff @ +25 °C
5. $I_{sat}2$: Peak current for approximately 20% rolloff @ +100 °C
6. $I_{sat}3$: Peak current for approximately 20% rolloff @ +125 °C
7. K-factor: Used to determine B_{p-p} for core loss (see graph).
   $B_{p-p} = K * L * \Delta I * 10^{-3}$. B_{p-p}:(Gauss), K: (K-factor from table),
   L: (Inductance in nH), ΔI (Peak to peak ripple current in Amps).
8. Part Number Definition: FP1008R4-Rxxx-R
   FP1008R4= Product code and size
   Rxxx= Inductance value in µH, R= decimal point
   -R suffix = RoHS compliant

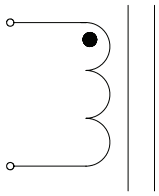
Dimensions (mm)



Recommended Pad Layout



Schematic



Part marking: FP1008R4, Rxxx (xxx = Inductance value in uH, R = decimal point), xxxx=Lot code

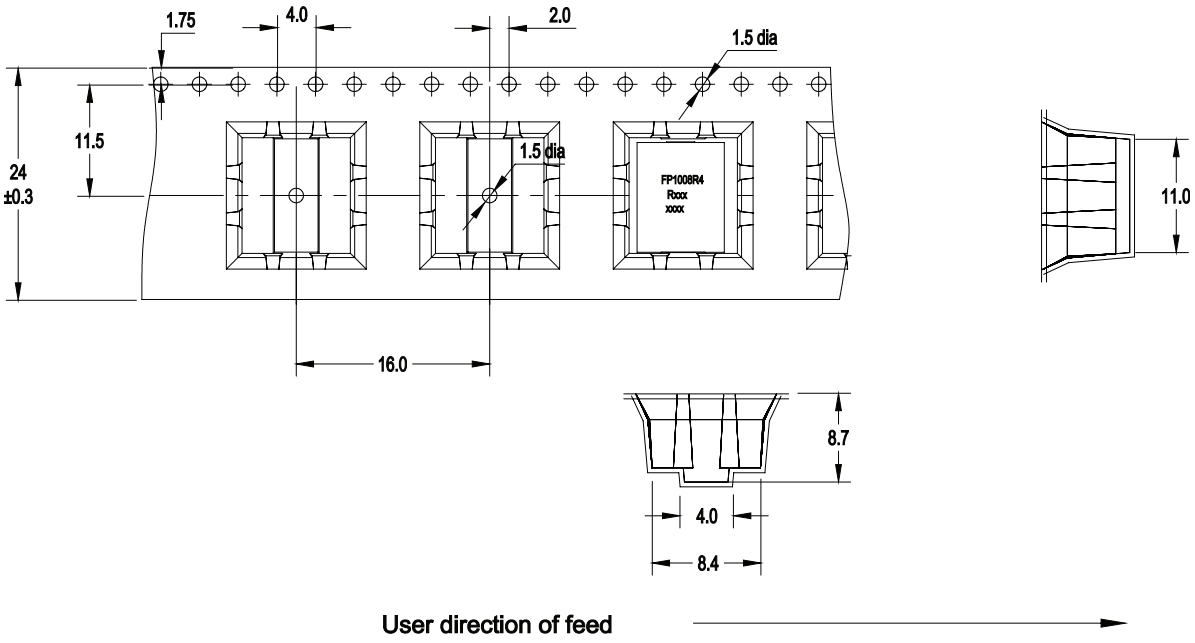
All soldering surface to be coplanar within 0.1 millimeters

DCR measured between point "a" to point "b"

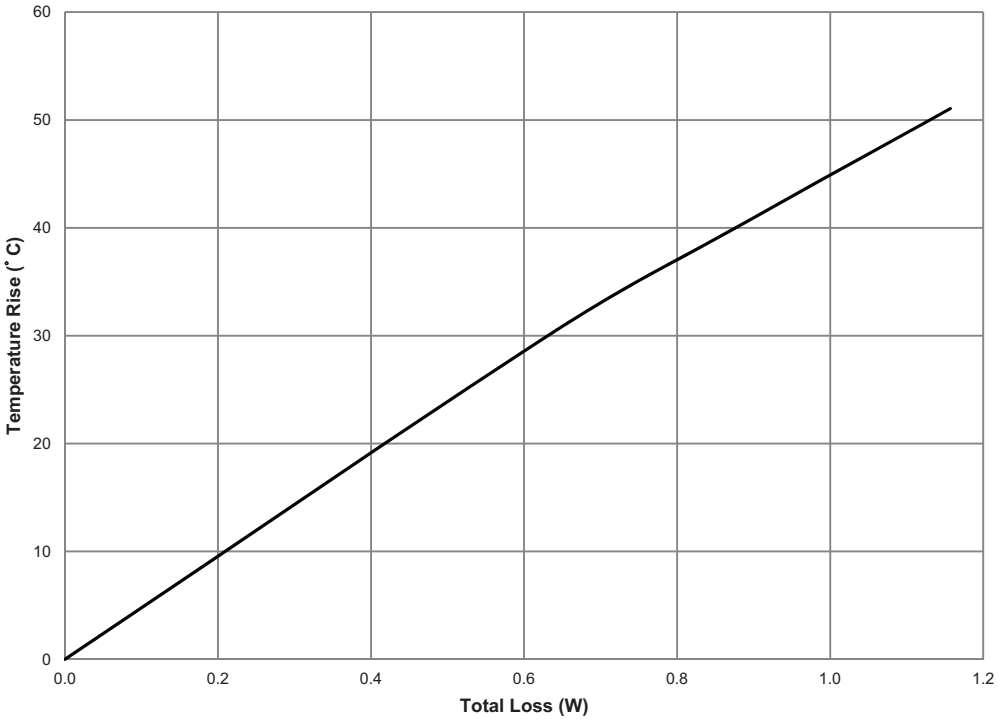
Do not route traces or vias underneath the inductor

Packaging information (mm)

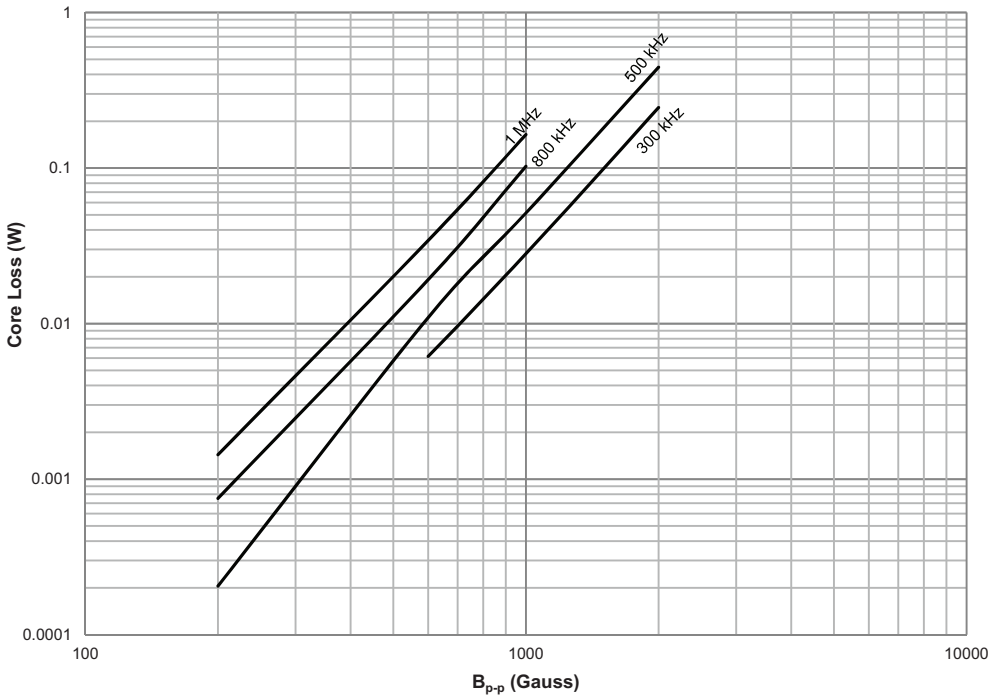
Supplied in tape and reel packaging , 400 parts per 13” diameter reel



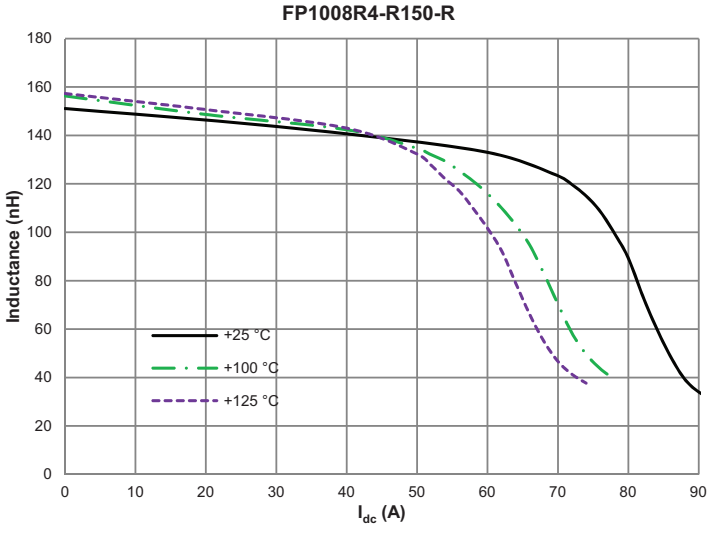
Temperature rise vs. total loss

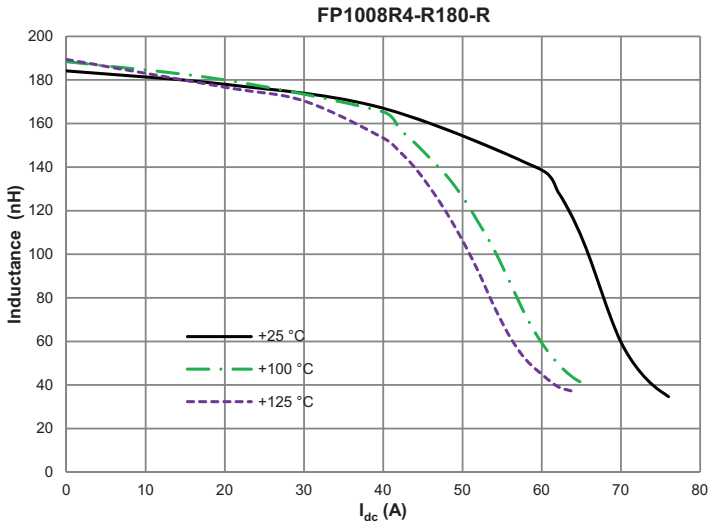


Core loss vs. B_{p-p}



Inductance characteristics





Solder reflow profile

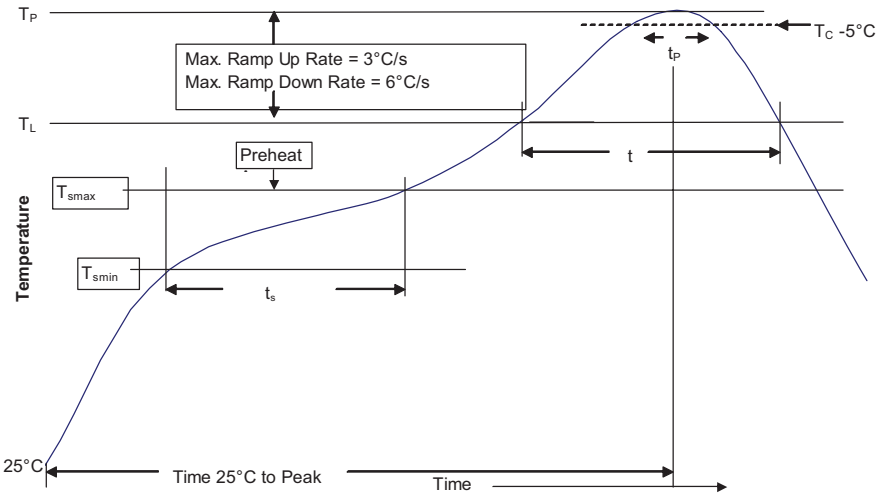


Table 1 - Standard SnPb Solder (T_C)

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-020

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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Publication No. 10499 BU-MC16135
November 2016