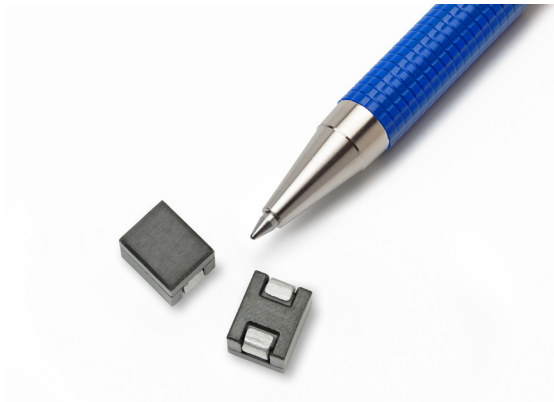


# FP1008R7

## High frequency, high current power inductors



### 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)

### Product features

- High current carrying capacity
- Low core loss
- Magnetically shielded
- Inductance Range from 100 nH to 180 nH
- Current range from 60 A to 100 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

### 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



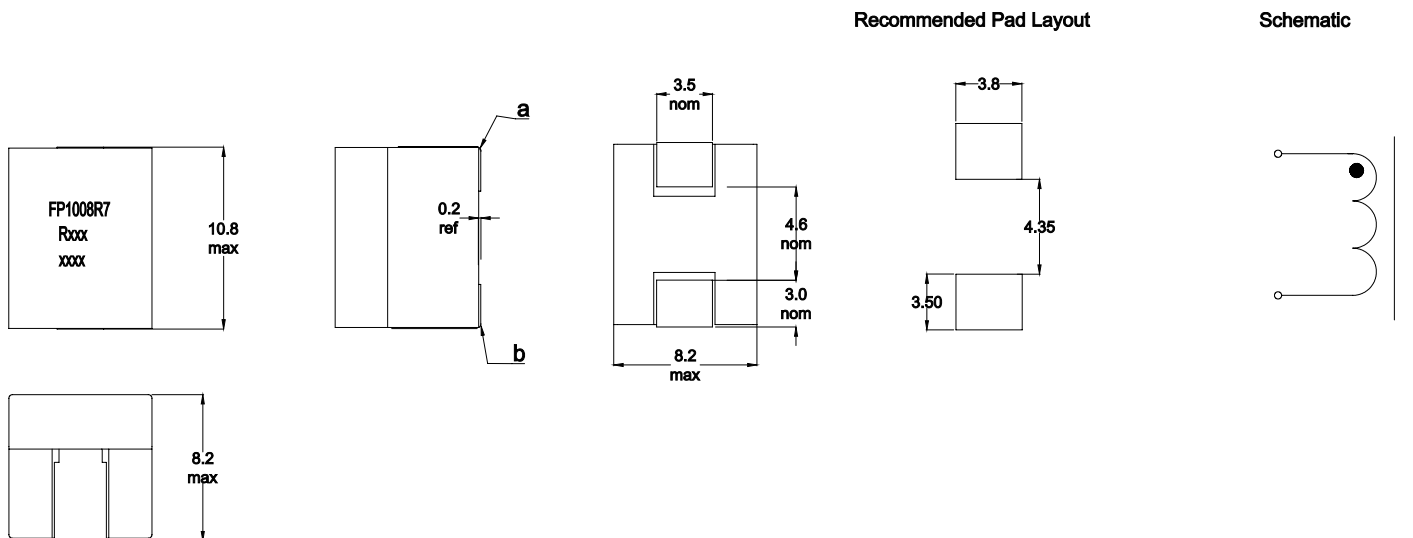
**Product specifications**

Part Number <sup>8</sup>	OCL <sup>1</sup> (nH) ±10%	FLL <sup>2</sup> (nH) minimum	I <sub>rms</sub> <sup>3</sup> (A)	I <sub>sat</sub> 1 <sup>4</sup> (A)	I <sub>sat</sub> 2 <sup>5</sup> (A)	I <sub>sat</sub> 3 <sup>6</sup> (A)	DCR (mΩ) maximum @ 20°C	K-factor <sup>7</sup>
FP1008R7-R100-R	100	72	72	100	90	84	0.120	361
FP1008R7-R120-R	120	86	72	90	75	70	0.120	361
FP1008R7-R150-R	150	108	72	72	60	56	0.120	361
FP1008R7-R180-R	180	130	72	60	50	46	0.120	361

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<sub>sat</sub>1, +25 °C
3. I<sub>rms</sub>: 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<sub>sat</sub>1: Peak current for approximately 20% rolloff @ +25 °C
5. I<sub>sat</sub>2: Peak current for approximately 20% rolloff @ +100 °C
6. I<sub>sat</sub>3: Peak current for approximately 20% rolloff @ +125 °C

7. K-factor: Used to determine B<sub>pp</sub> for core loss (see graph).  
 $B_{pp} = K * L * \Delta I * 10^{-3}$ , B<sub>pp</sub>(Gauss), K: (K-factor from table),  
 L: (Inductance in nH), ΔI (Peak to peak ripple current in Amps).
8. Part Number Definition: FP1008R7-Rxxx-R  
 FP1008R7= Product code and size  
 x= Version indicator  
 Rxxx= Inductance value in μH, R= decimal point  
 -R suffix = RoHS compliant

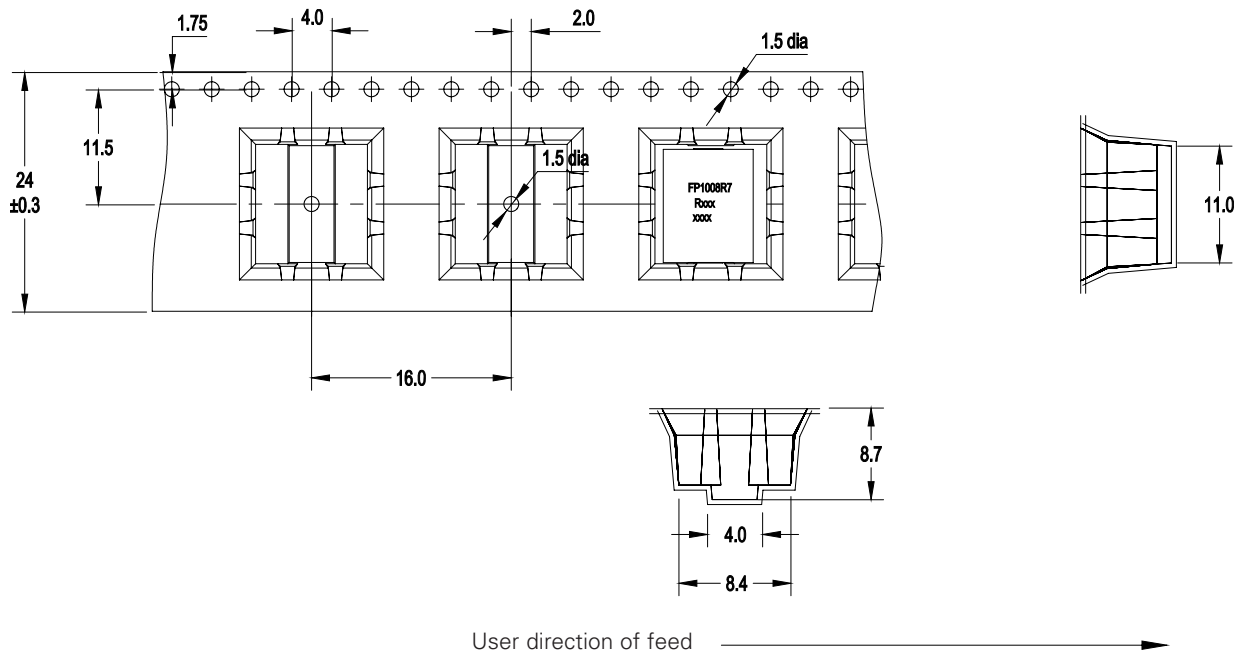
**Dimensions (mm)**



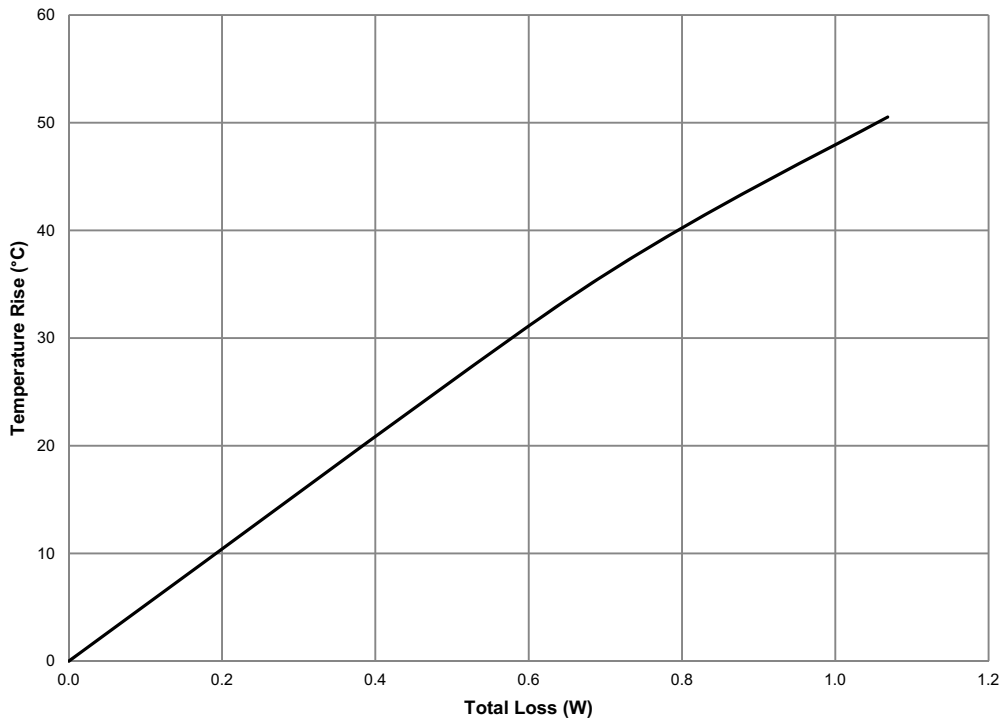
Part marking: FP1008R7, Rxxx (xxx=inductance value in μH, R=decimal point),  
 xxxx=Lot code  
 Tolerances are ±0.15 millimeters unless stated otherwise.  
 All soldering surfaces to be coplanar within 0.1 millimeters  
 Pad layout tolerances are ±0.1 millimeters unless stated otherwise  
 DCR measured from point "a" to point "b"  
 Do not route traces or vias underneath the inductor

**Packaging information (mm)**

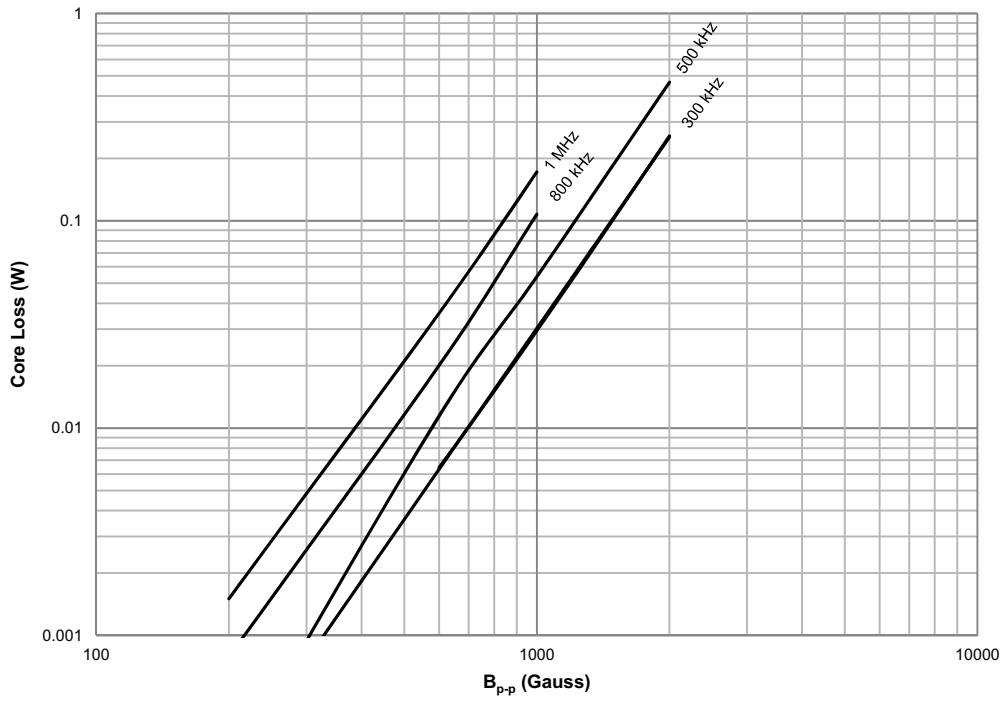
Supplied in tape and reel packaging , 400 parts per 13" diameter reel



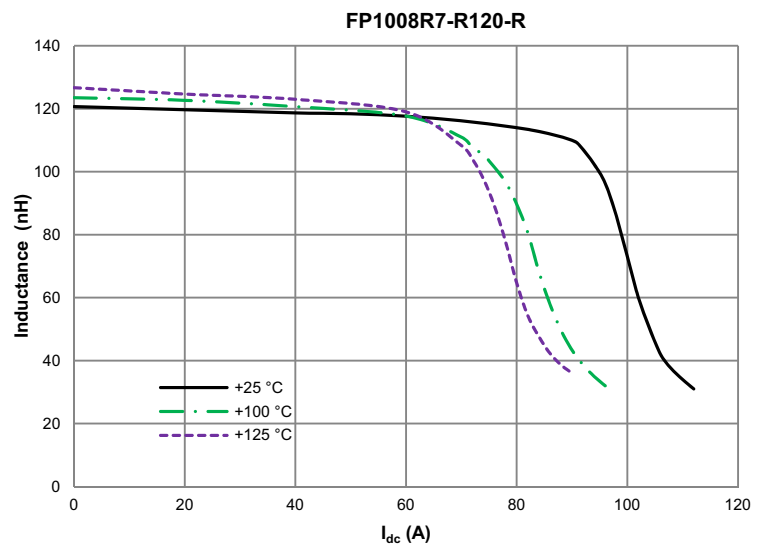
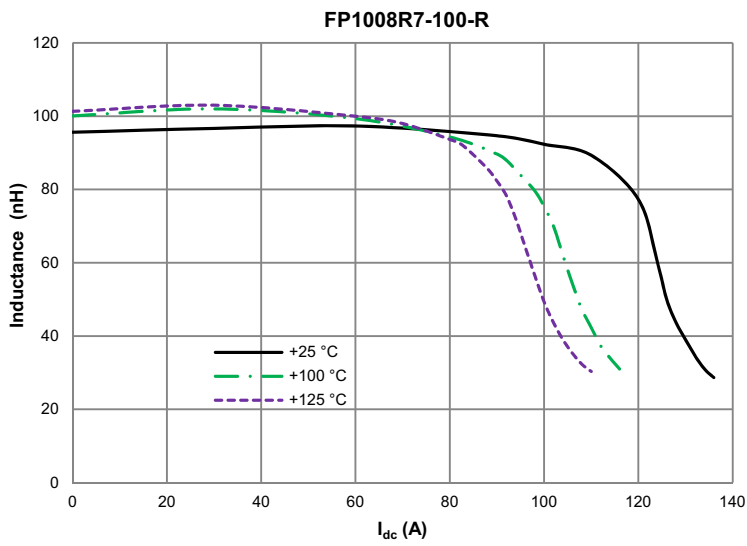
**Temperature rise vs. total loss**



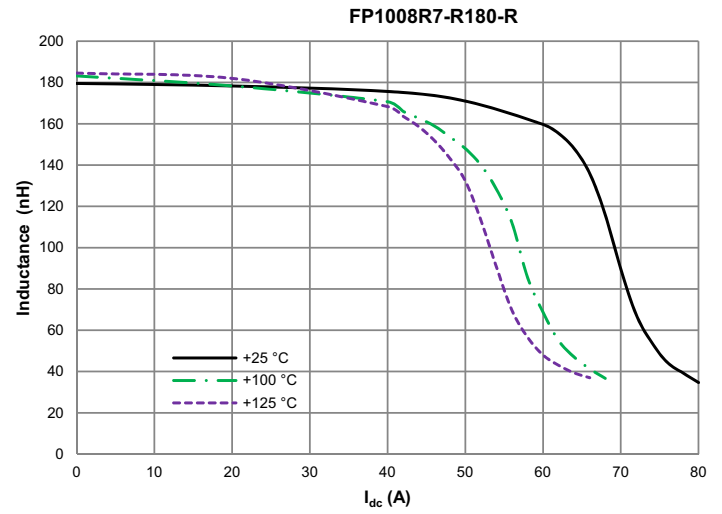
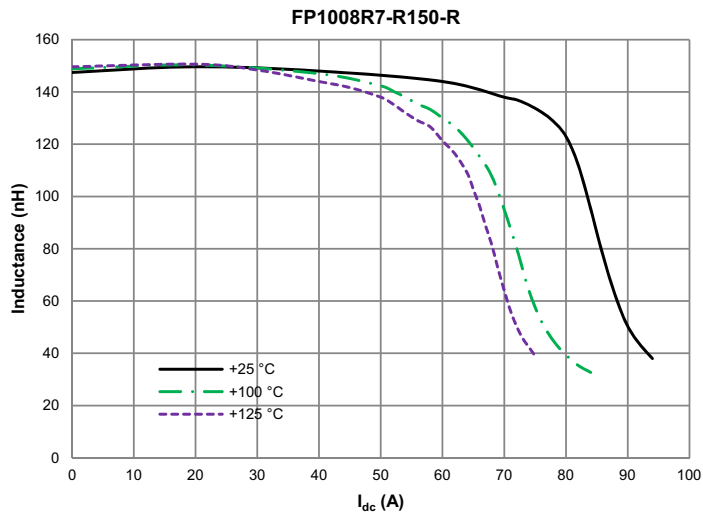
Core loss vs.  $B_{p-p}$



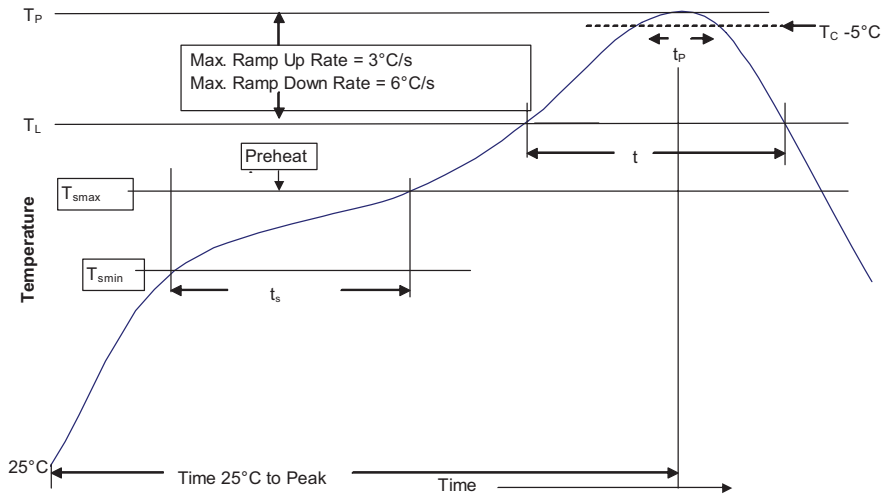
Inductance characteristics



Inductance characteristics



**Solder reflow profile**



**Table 1 - Standard SnPb Solder (T<sub>C</sub>)**

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5mm	235 °C	220 °C
≥2.5mm	220 °C	220 °C

**Table 2 - Lead (Pb) Free Solder (T<sub>C</sub>)**

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350 - 2000	Volume mm <sup>3</sup> >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 <sub>smin</sub> )	100 °C	150 °C
• Temperature max. (T <sub>smax</sub> )	150 °C	200 °C
• Time (T <sub>smin</sub> to T <sub>smax</sub> ) (t <sub>s</sub> )	60-120 Seconds	60-120 Seconds
Average ramp up rate T <sub>smax</sub> to T <sub>p</sub>	3 °C/ Second Max.	3 °C/ Second Max.
Liquidous temperature (T <sub>L</sub> )	183 °C	217 °C
Time at liquidous (t <sub>L</sub> )	60-150 Seconds	60-150 Seconds
Peak package body temperature (T <sub>p</sub> )*	Table 1	Table 2
Time (t <sub>p</sub> )** within 5 °C of the specified classification temperature (T <sub>C</sub> )	20 Seconds**	30 Seconds**
Average ramp-down rate (T <sub>p</sub> to T <sub>smax</sub> )	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<sub>p</sub>) is defined as a supplier minimum and a user maximum.  
 \*\* Tolerance for time at peak profile temperature (t<sub>p</sub>) is defined as a supplier minimum and a user maximum.

Life Support Policy: Eaton does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

Eaton reserves the right, without notice, to change design or construction of any products and to discontinue or limit distribution of any products. Eaton also reserves the right to change or update, without notice, any technical information contained in this bulletin.

**Eaton**  
**Electronics Division**  
 1000 Eaton Boulevard  
 Cleveland, OH 44122  
 United States  
[www.eaton.com/electronics](http://www.eaton.com/electronics)

© 2016 Eaton  
 All Rights Reserved  
 Publication No. 10629 BU-MC16139  
 December 2016

Eaton is a registered trademark.  
 All other trademarks are property of their respective owners.

