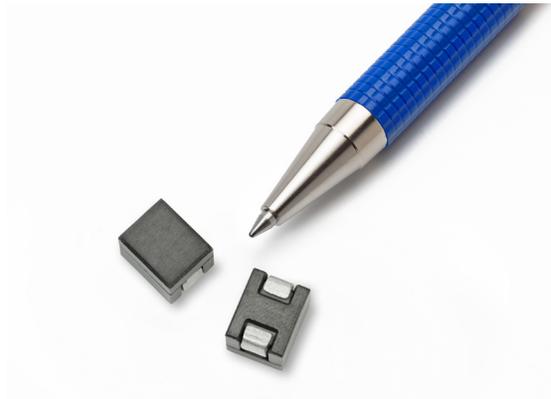


# FP1008R7

## 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



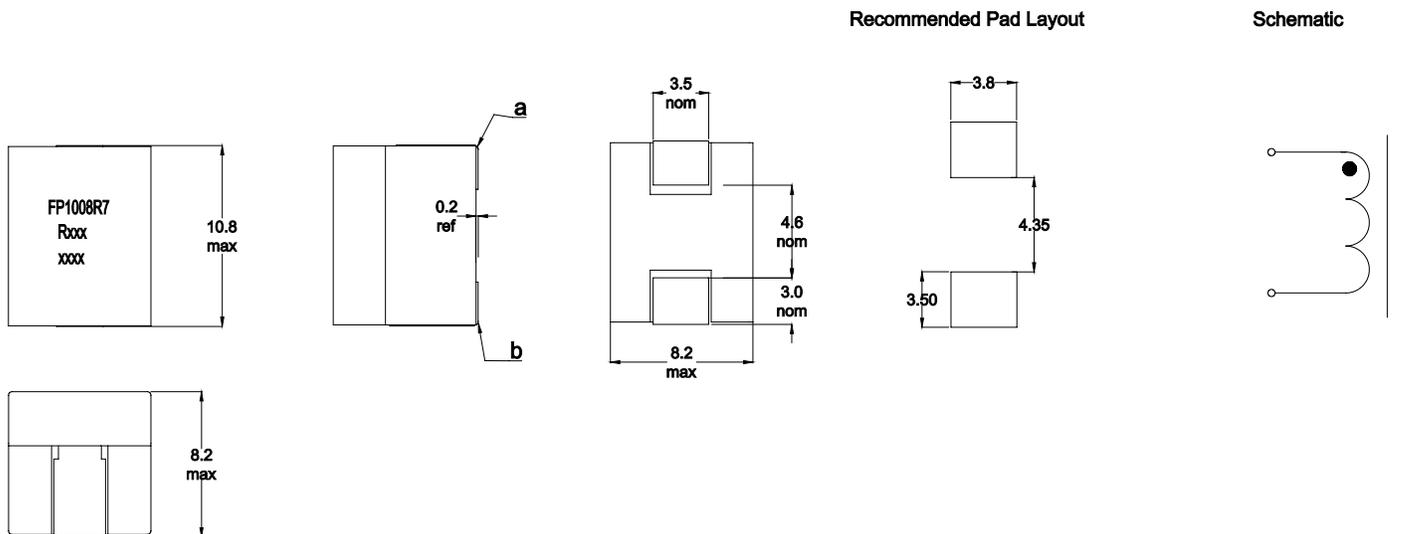
**Product specifications**

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

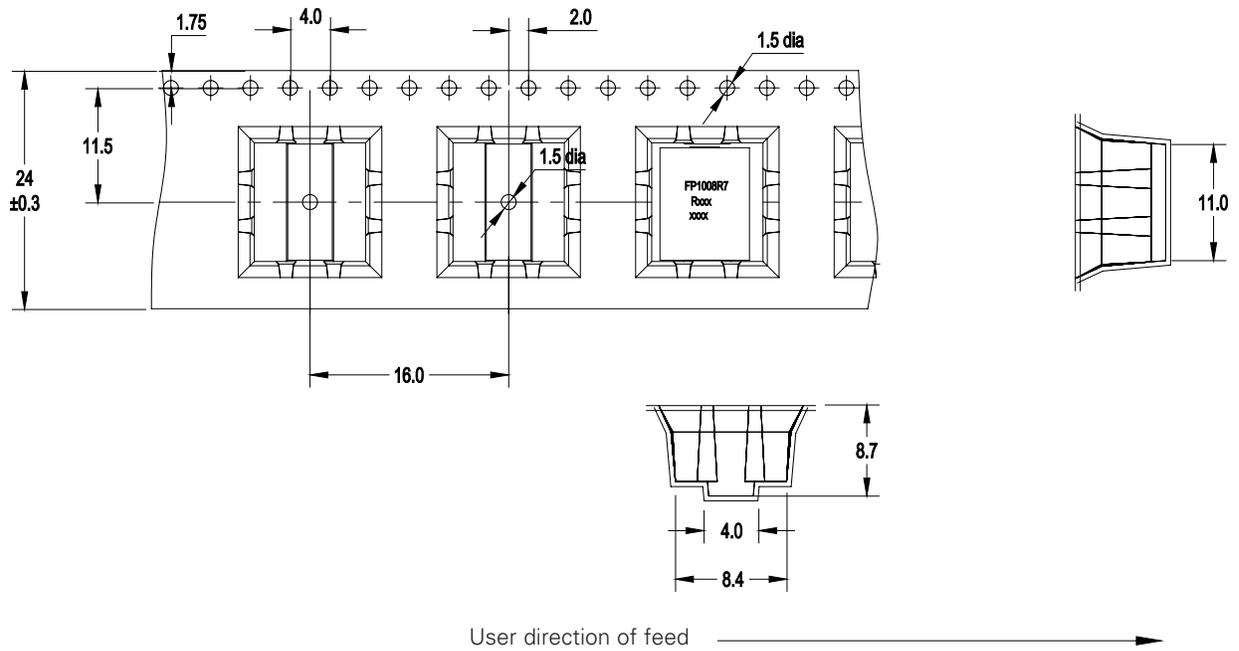
**Dimensions (mm)**



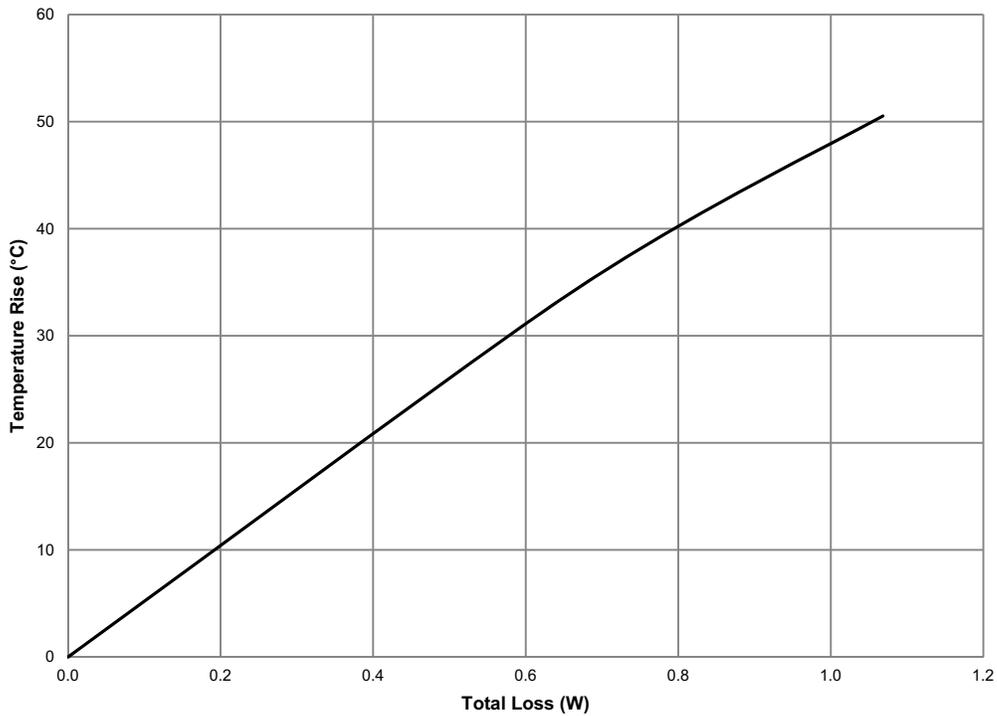
Part marking: FP1008R7, Rxxx (xxx=inductance value in μH, R=decimal point),  
 xxxx=Lot code  
 Tolerances are ±0.15 millimeters unless stated otherwise.  
 All soldering surfaces to be coplanar within 0.1 millimeters  
 Pad layout tolerances are ±0.1 millimeters unless stated otherwise  
 DCR measured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

**Packaging information (mm)**

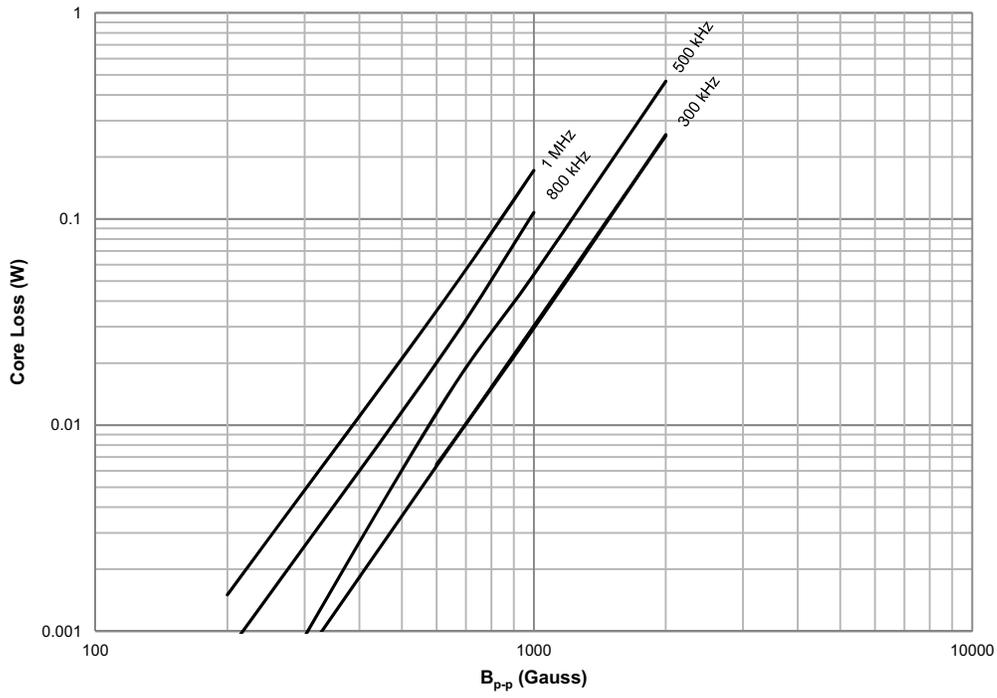
Supplied in tape and reel packaging , 400 parts per 13" diameter reel



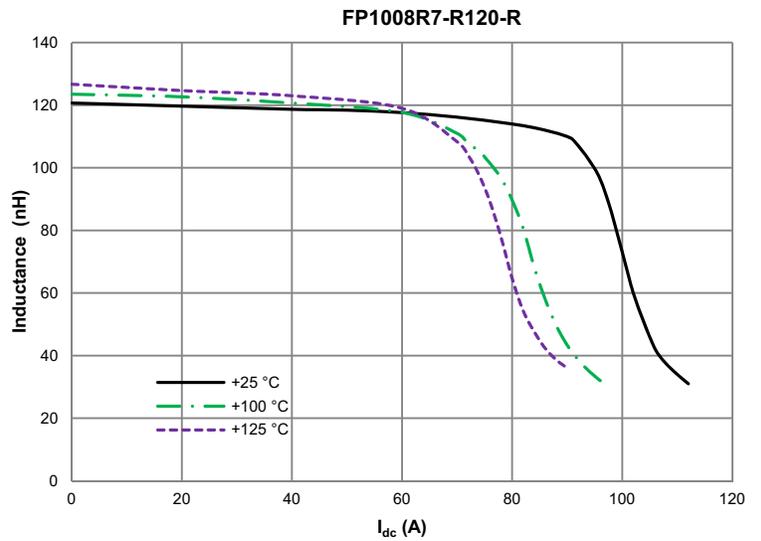
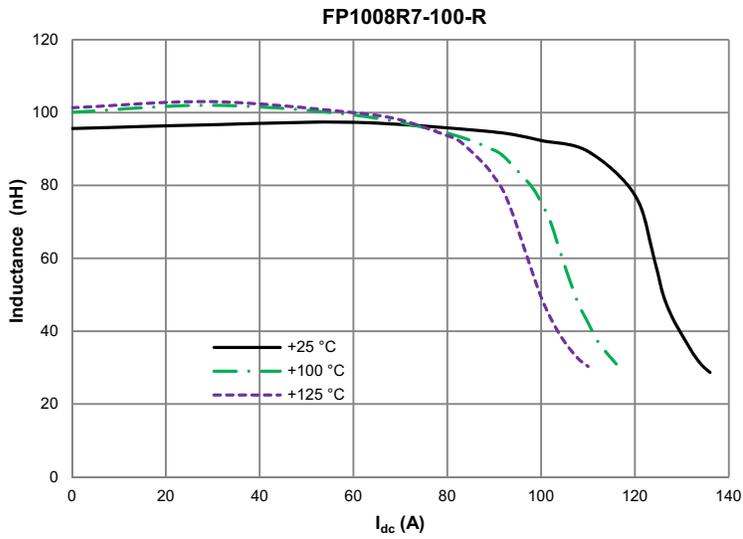
**Temperature rise vs. total loss**



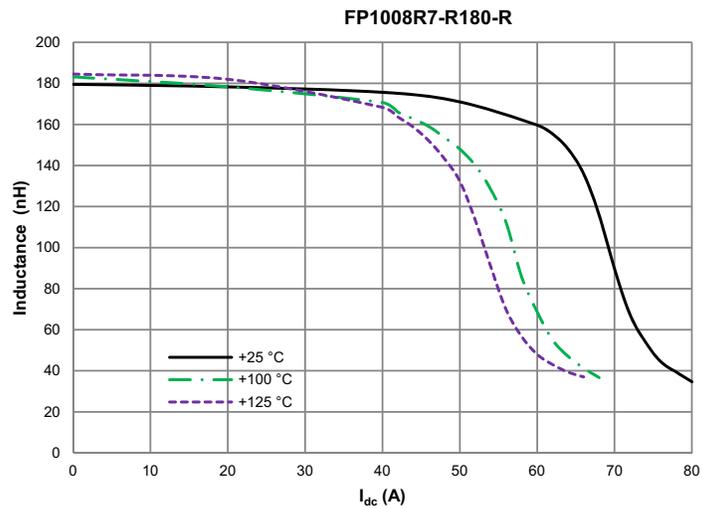
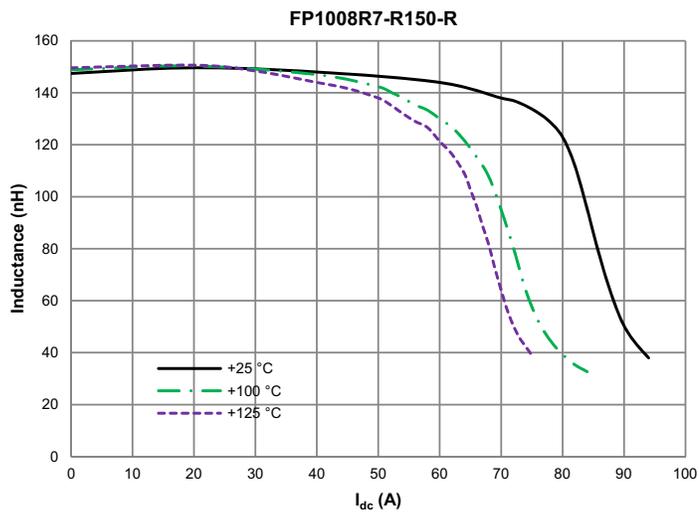
Core loss vs.  $B_{p-p}$



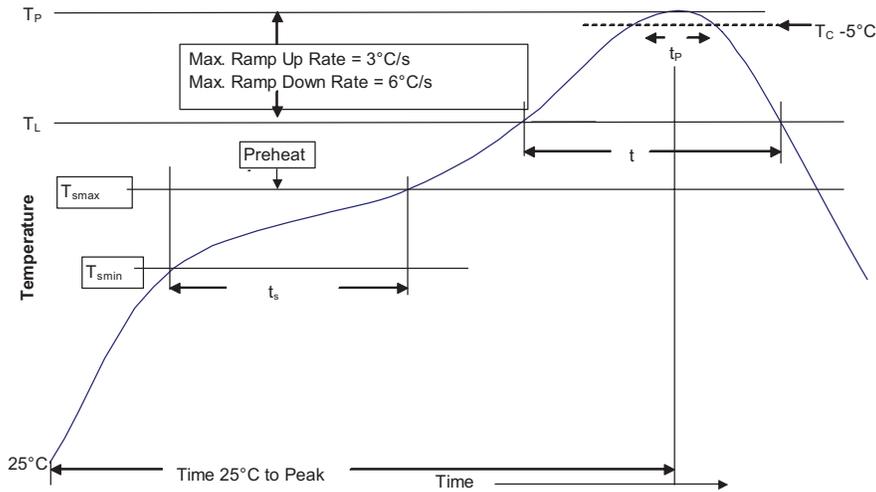
Inductance characteristics



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.

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