

# FP1008L

## High frequency, high current power inductors



### Applications

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

### Description

- High current carrying capacity
- Low DCR
- Low core loss
- Controlled DCR for sensing circuits
- Inductance range from 100nH to 150nH
- Current range from 50 to 75 amps
- 9.6 x 6.4 and 7.5mm footprint surface mount package in an 8.0mm height
- Ferrite core material
- Halogen free, lead free, RoHS compliant

### 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-020D compliant



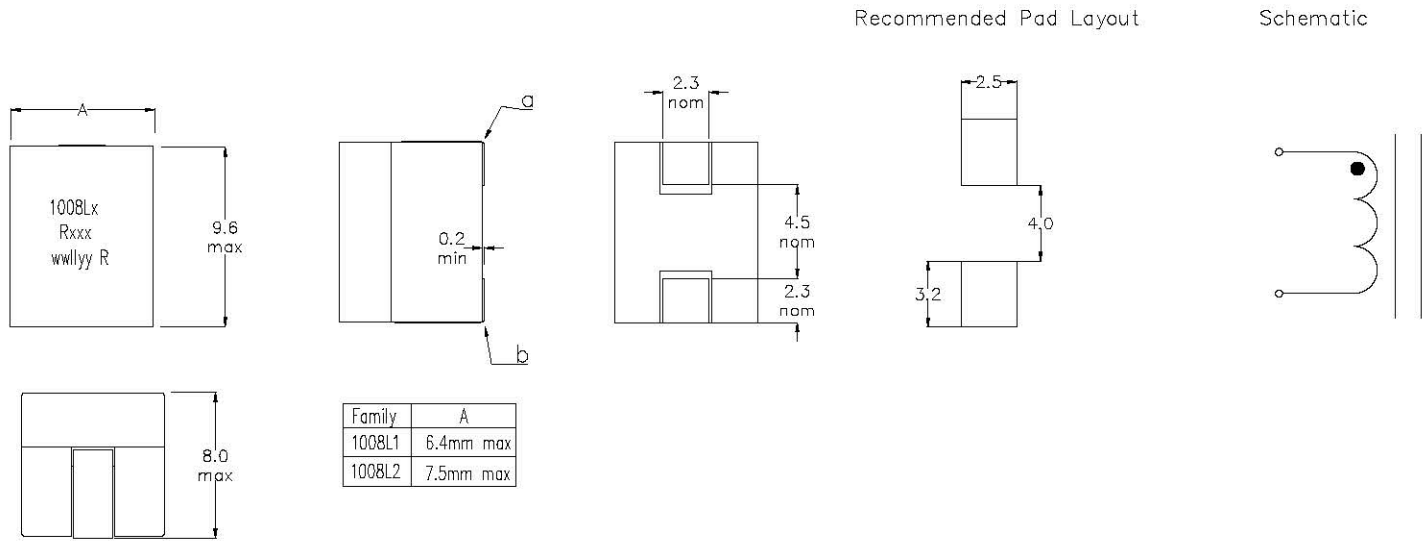
**Product Specifications**

Part Number <sup>8</sup>	OCL <sup>1</sup> (nH) ±10%	FLL <sup>2</sup> (nH) minimum	I <sub>rms</sub> <sup>3</sup> (amps)	I <sub>sat</sub> <sup>14</sup> (amps)	I <sub>sat</sub> <sup>25</sup> (amps)	I <sub>sat</sub> <sup>36</sup> (amps)	DCR (mΩ) @ 20°C	K-factor <sup>7</sup>
<b>L1 Version</b>								
FP1008L1-R100-R	100	72	65	75	65	63	0.17 ±5%	461
FP1008L1-R150-R	150	108	65	50	44	42	0.17 ±5%	461
<b>L2 Version</b>								
FP1008L2-R150-R	150	108	65	65	57	55	0.17 ±15%	411

- Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.1Vrms, 0.0A<sub>dc</sub>, @ +25°C
- Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1Vrms, @ I<sub>sat</sub>1, @ +25°C
- 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.

- I<sub>sat</sub>1: Peak current for approximately 20% rolloff @ +25°C
- I<sub>sat</sub>2: Peak current for approximately 20% rolloff @ +100°C
- I<sub>sat</sub>3: Peak current for approximately 20% rolloff @ +125°C
- K-factor: Used to determine B<sub>p-p</sub> for core loss (see graph). B<sub>p-p</sub> = K \* L \* ΔI \* 10<sup>3</sup> B<sub>p-p</sub> (Gauss), K: (K-factor from table), L: (Inductance in nH), ΔI (Peak to peak ripple current in Amps).
- Part Number Definition: FP1008Lx-Rxxx-R  
FP1008L = Product code and size  
x = Version indicator  
Rxxx = inductance value in μH, R = decimal point ,  
-R suffix = RoHS compliant

**Dimensions (mm)**



Part marking: 1008Lx (x= Version indicator), Rxxx (xxx=inductance value in uH, R= decimal point), wwlllyy= date code, R= revision level  
Tolerances are ±0.15 millimeters unless stated otherwise  
PCB tolerances are ±0.1 millimeters unless stated otherwise  
All soldering surfaces to be coplanar within 0.1 millimeters  
DCR measured from point "a" to point "b"  
Do not route traces or vias underneath the inductor

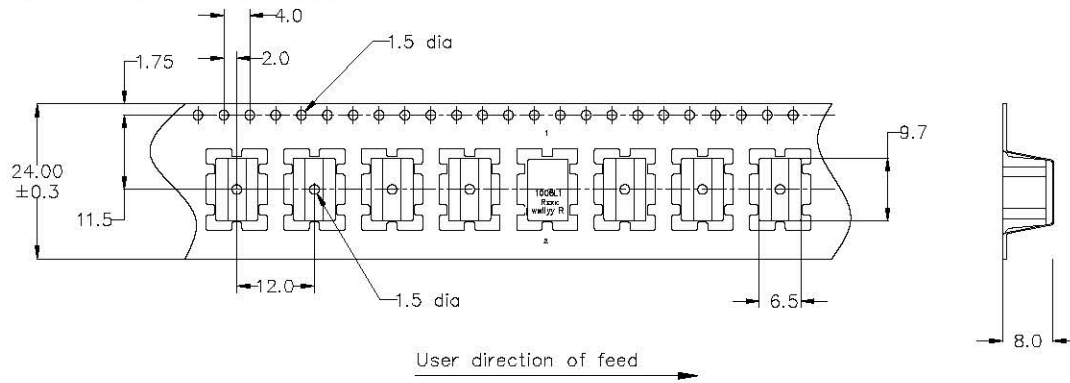
**Packaging information (mm)**

Supplied in tape and reel packaging

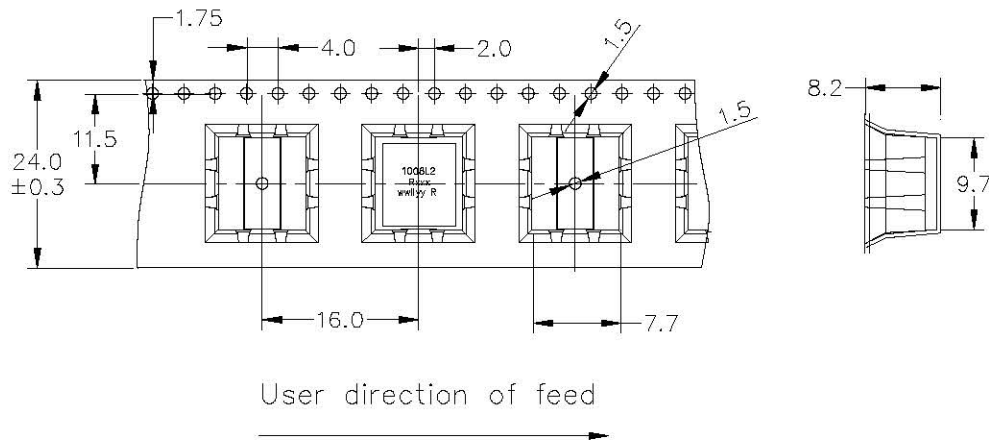
FP1008L1: 600 parts per 13" diameter reel

FP1008L2: 500 parts per 13" diameter reel

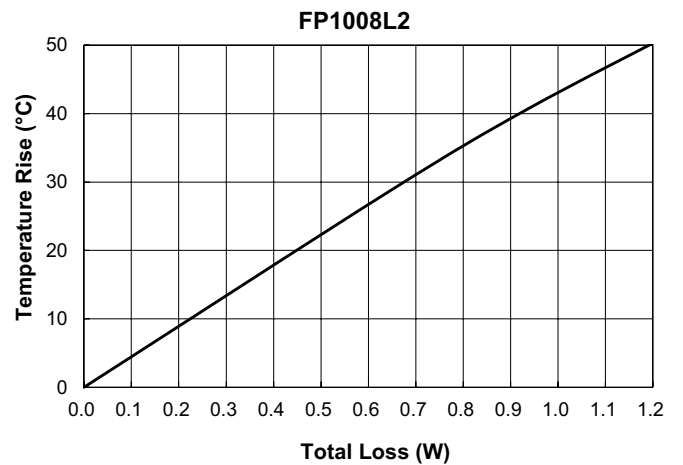
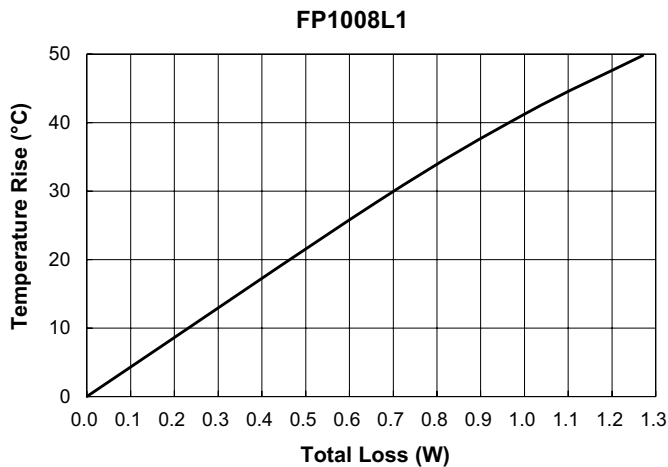
**FP1008L1 (Drawing not to scale)**



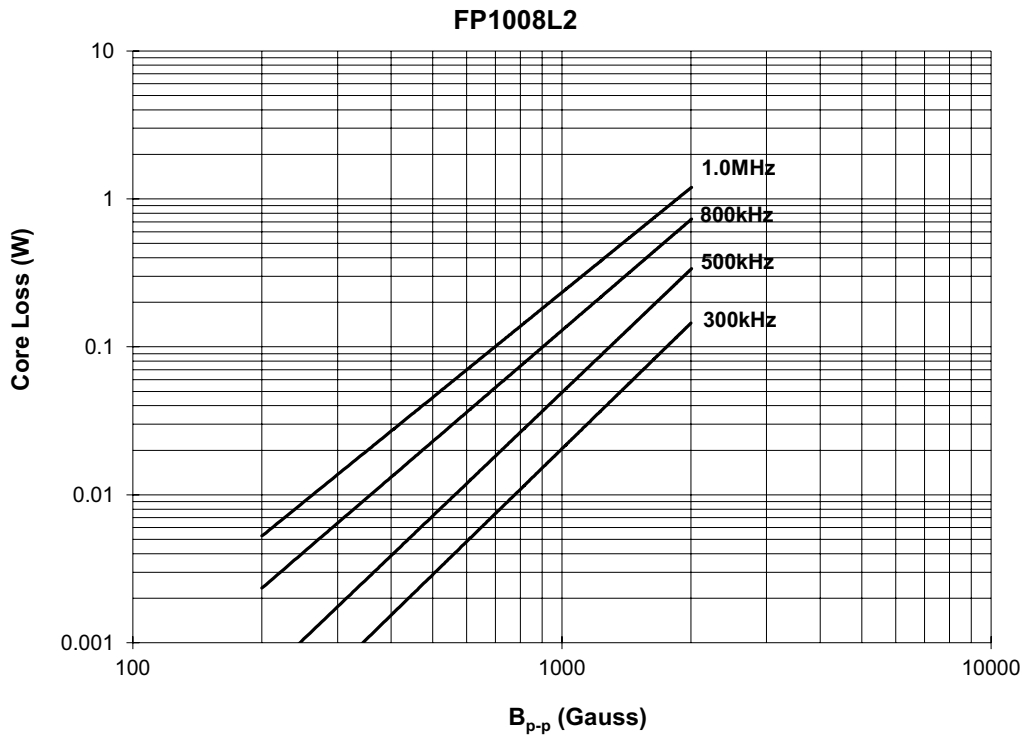
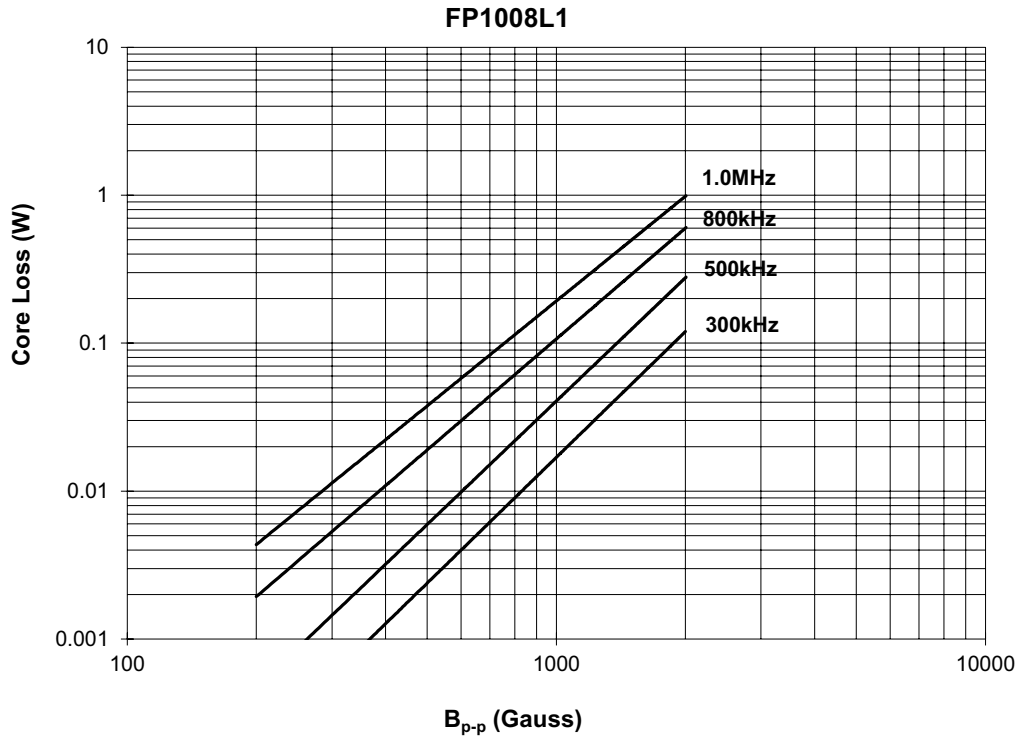
**FP1008L2 (Drawing not to scale)**



**Temperature rise vs. total loss**

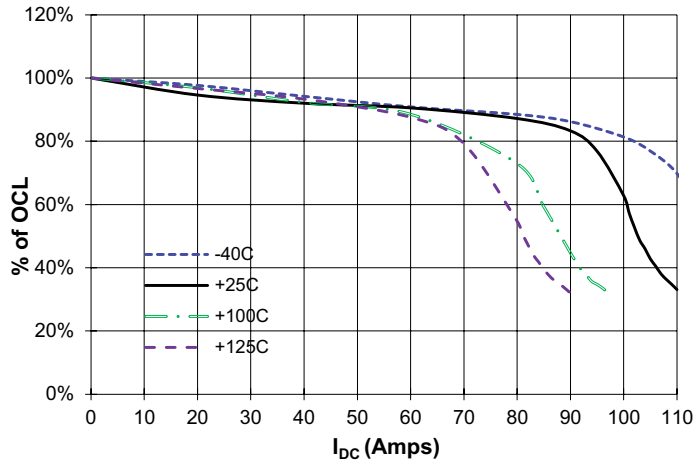


Core loss vs.  $B_{p-p}$

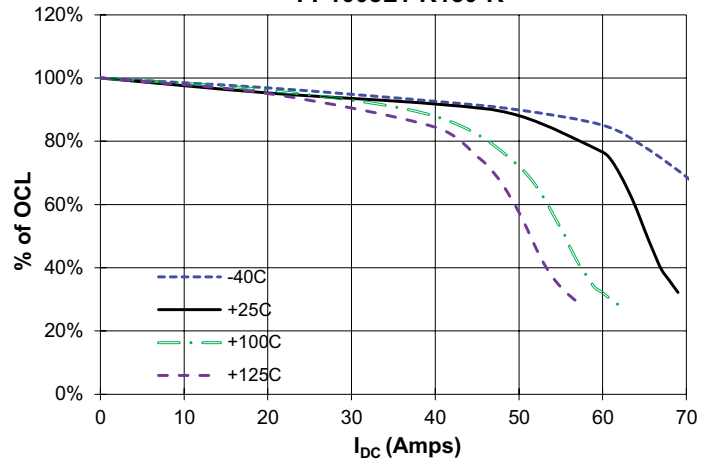


Inductance characteristics

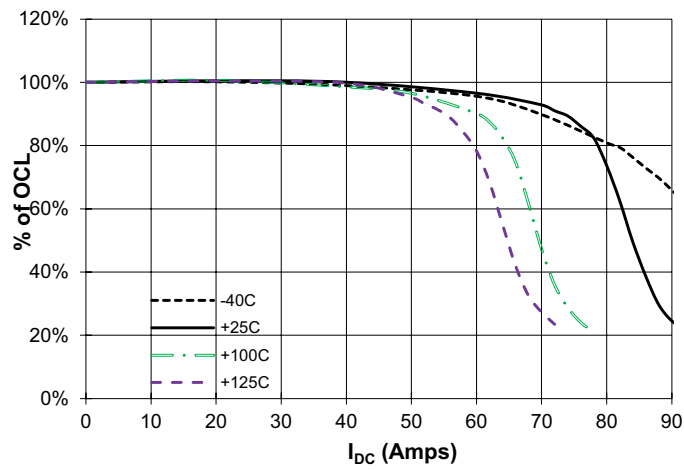
FP1008L1-R100-R



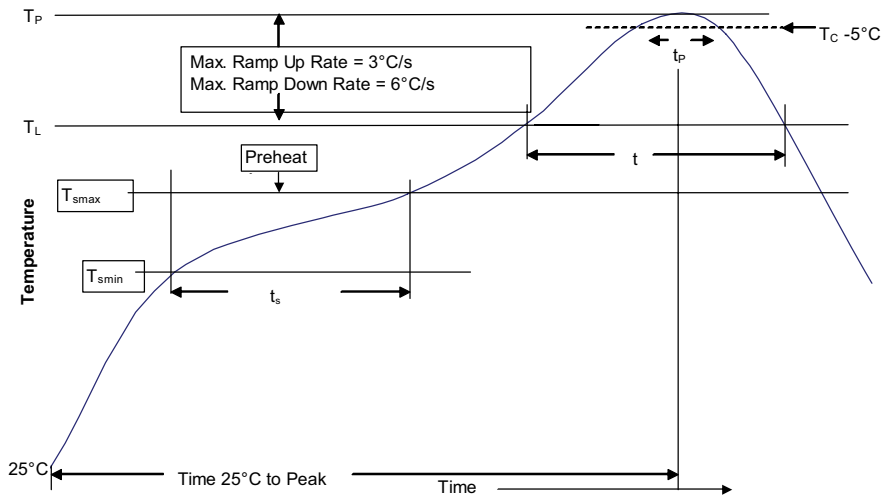
FP1008L1-R150-R



FP1008L2-R150-R



**Solder reflow profile**



**Table 1 - Standard SnPb Solder ( $T_C$ )**

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 ( $T_C$ )**

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-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 ( $T_L$ )	183°C	217°C
Time at liquidous ( $t_L$ )	60-150 Seconds	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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