

# FP1 108L3 and FP1 108L4

## High frequency, high current power inductors



### Description

- High current carrying capacity
- Ultra low DCR
- Low core loss
- Operating frequency
  - L3 version 500kHz-800kHz
  - L4 version 1MHz-3MHz
- Inductance range from 105nH to 180nH
- Current range from 33 to 57 amps
- 11.0 x 8.0mm footprint surface mount package in an 8.0mm height
- Ferrite core material
- Halogen free, lead free, RoHS compliant

### Applications

- Servers
- Multi-phase and Vcore regulators
- Voltage Regulator Modules (VRMs)
- Desktop VRMs and EVRDs
- Data networking and storage systems
- Graphics cards and battery power systems
- Point-of-Load modules

### 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



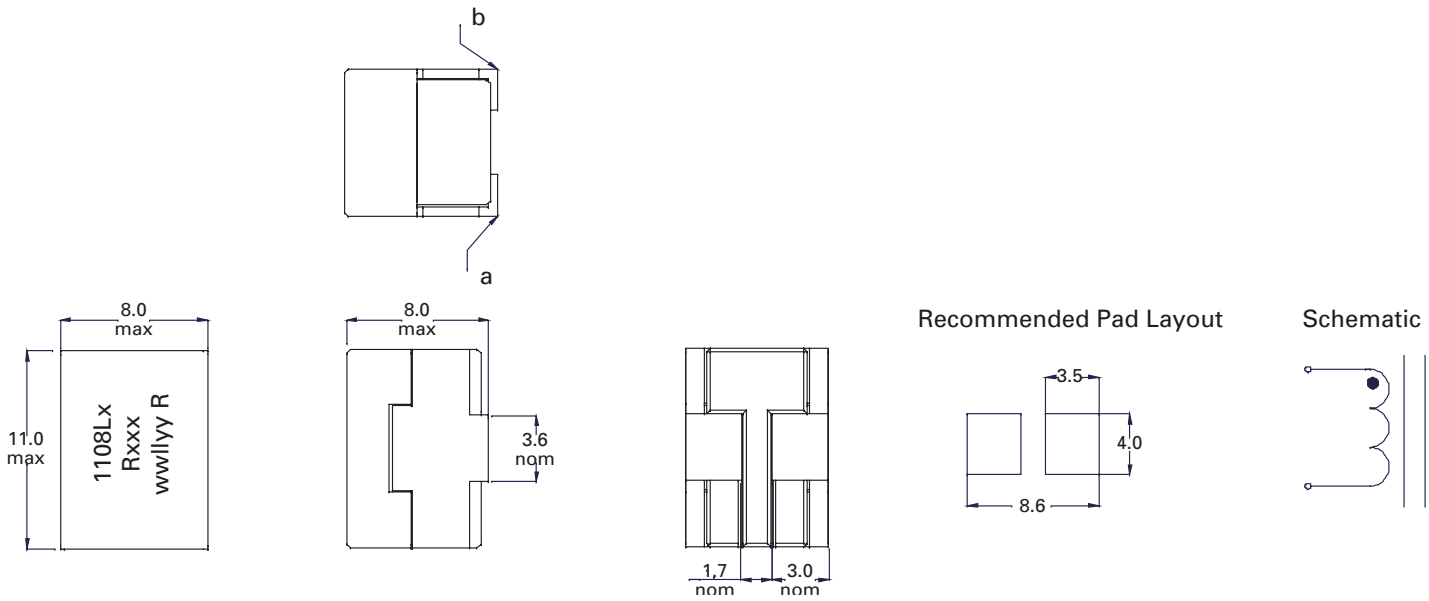
**Product Specifications**

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>1</sup> (amps)	I <sub>sat</sub> <sup>2</sup> (amps)	I <sub>sat</sub> <sup>3</sup> (amps)	DCR (mΩ) ±10% @ 20°C	K-factor <sup>7</sup>
<b>L3 Version</b>								
FP1108L3-R105-R	105	76	91	57	48	45	0.05	552
<b>L4 Version</b>								
FP1108L4-R120-R	120	86	91	50	42	40	0.05	552
FP1108L4-R150-R	150	108	91	40	34	32	0.05	552
FP1108L4-R180-R	180	129	91	33	28	26	0.05	552

1. Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.1Vrms, 0.0Adc, @ +25°C
2. Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1Vrms, @ 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. This is for reference only and does not represent absolute maximum ratings. 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>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).
8. Part Number Definition: FP1108Lx-Rxxx-R  
FP1108L = Product code and size  
x= Version indicator  
Rxxx= inductance value in μH, R= decimal point ,  
-R suffix = RoHS compliant

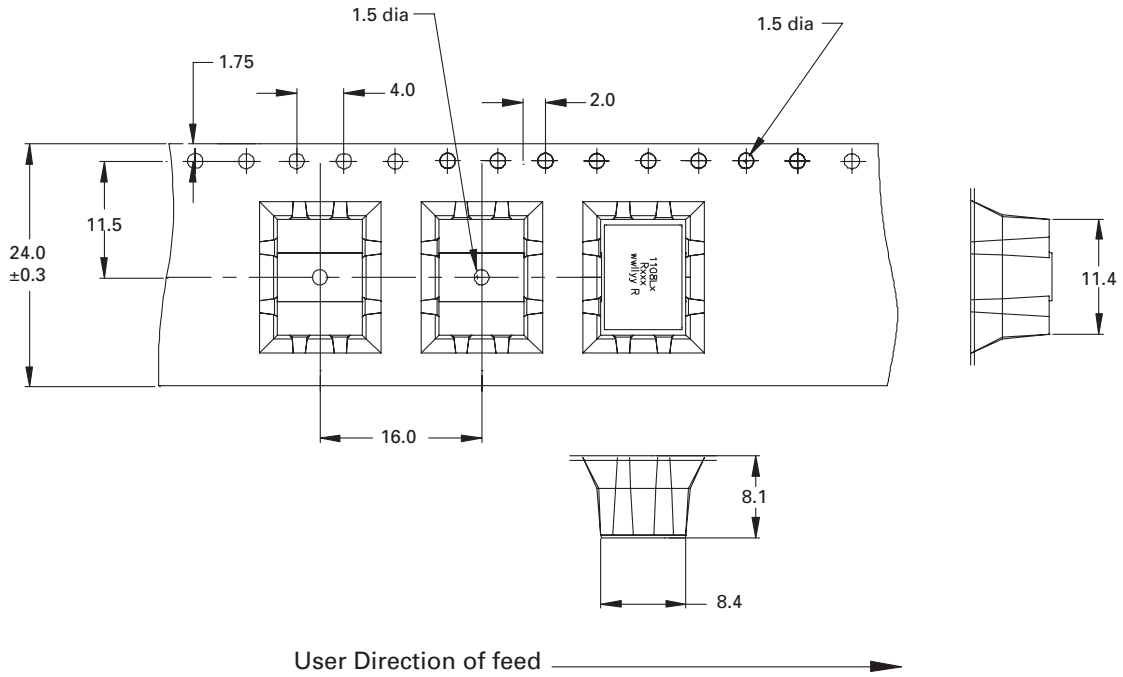
**Dimensions (mm)**



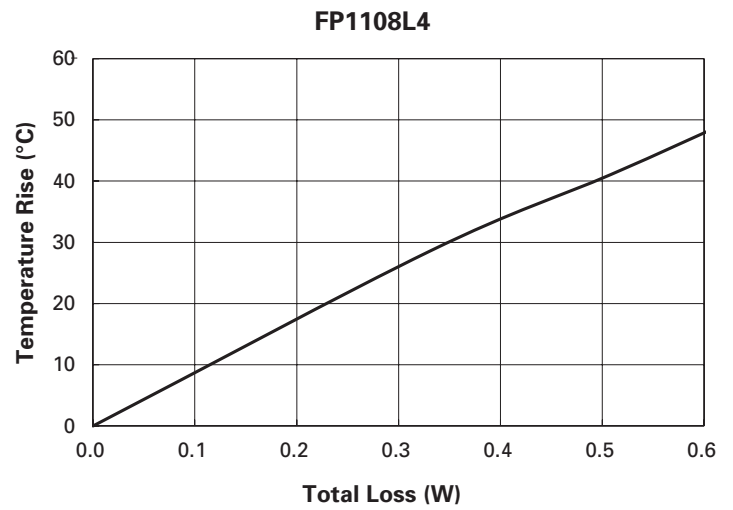
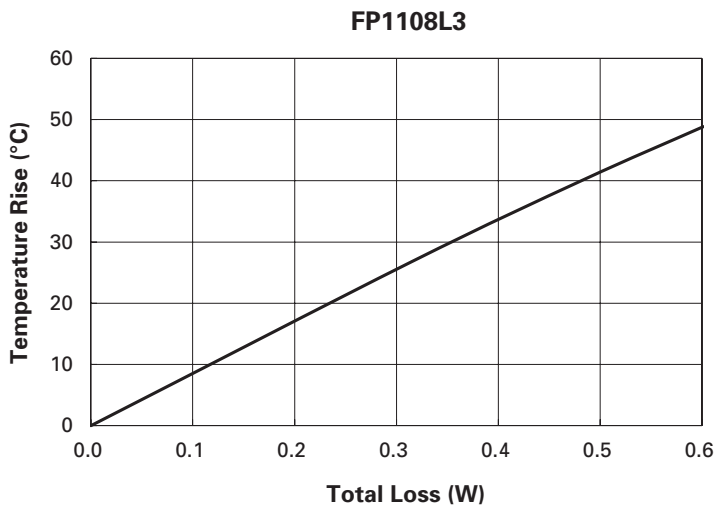
Part marking: 1108Lx (x = Version indicator), Rxxx = Inductance value in uH (R= decimal point)  
wwlllyy = date code, R = revision level  
All soldering surfaces to be coplanar within 0.1 millimeters  
PCB tolerances are ±0.1 millimeters unless otherwise specified  
DCR measured from point "a" to point "b"  
Do not route traces or vias underneath the inductor

**Packaging information (mm)**

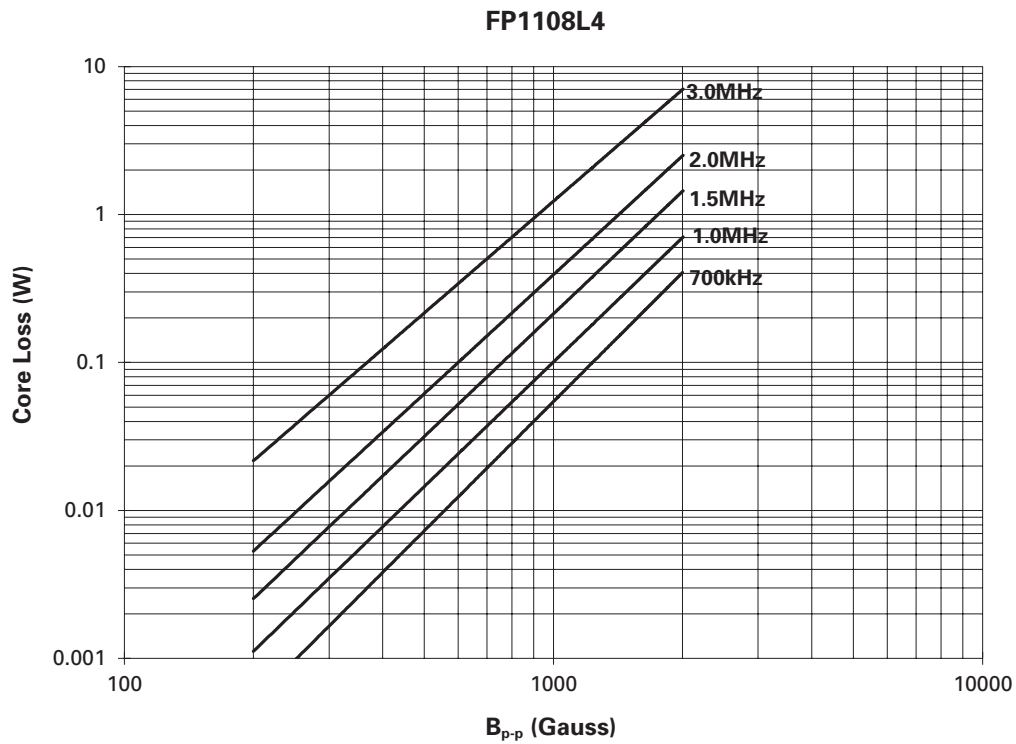
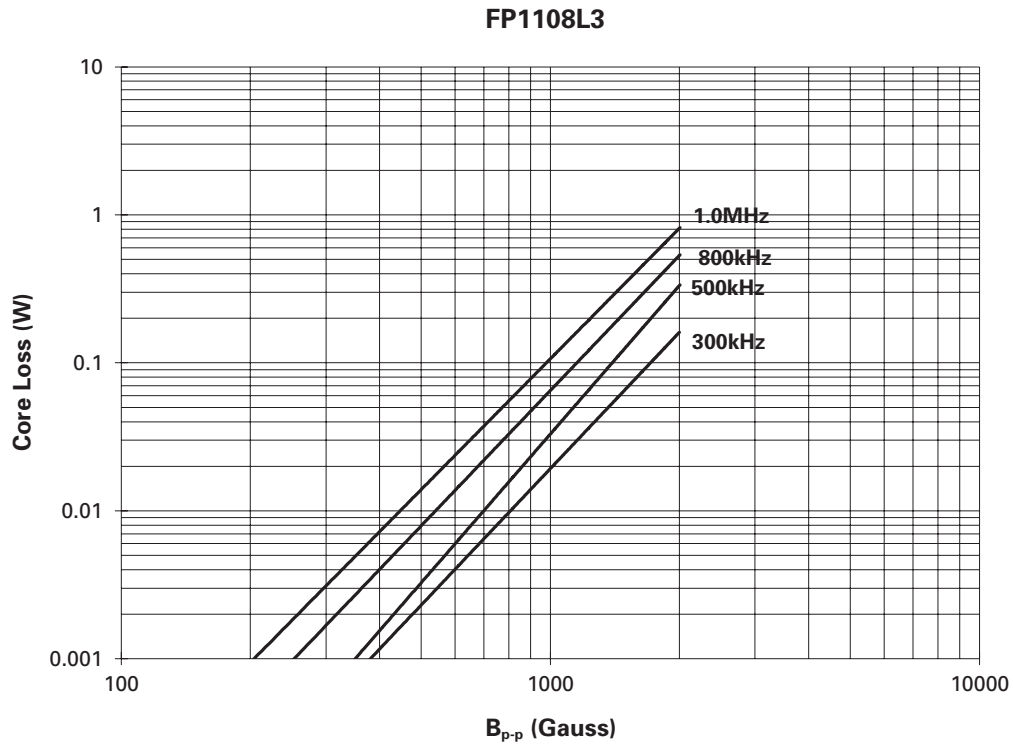
Supplied in tape and reel packaging, 500 parts per 13" diameter reel



**Temperature rise vs. total loss**

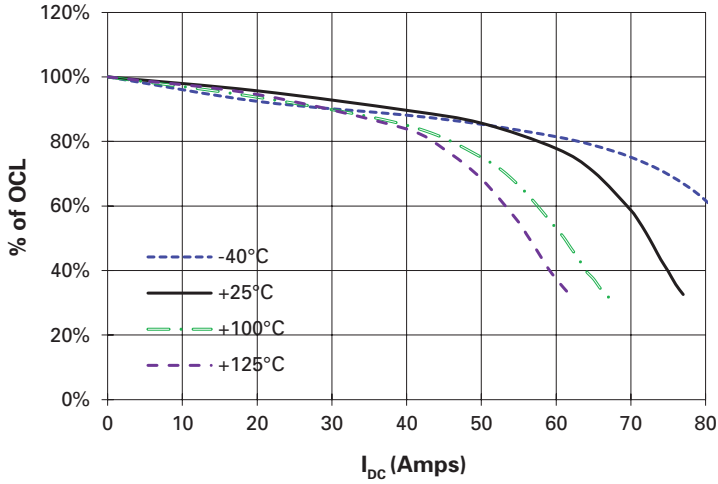


Core loss vs.  $B_{p-p}$

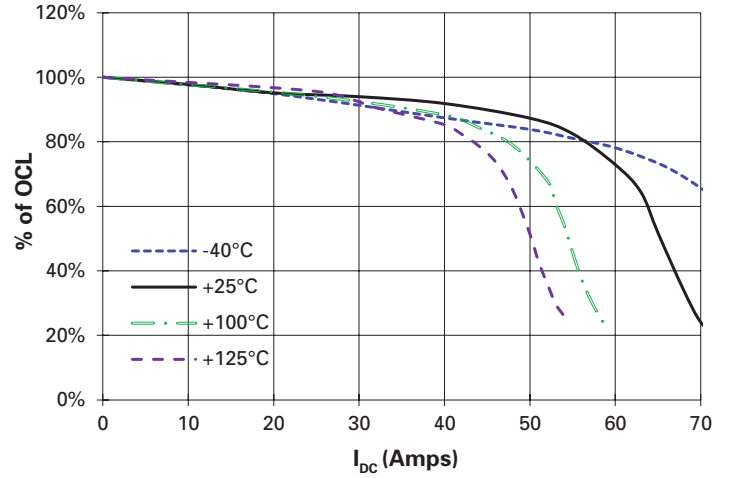


Inductance characteristics

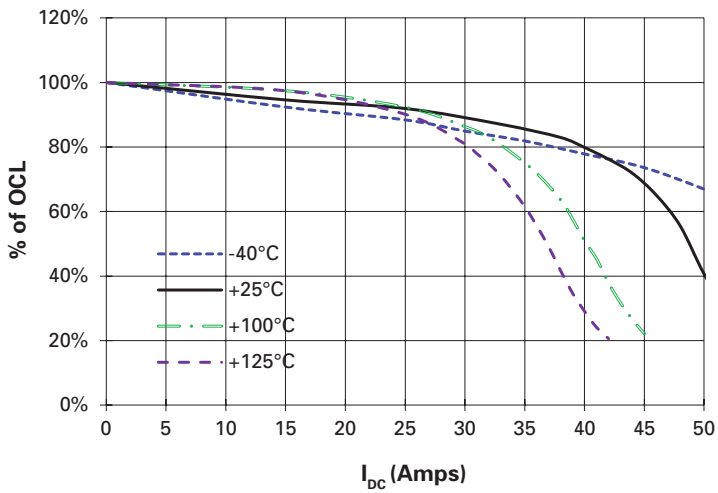
FP1108L3-R105-R



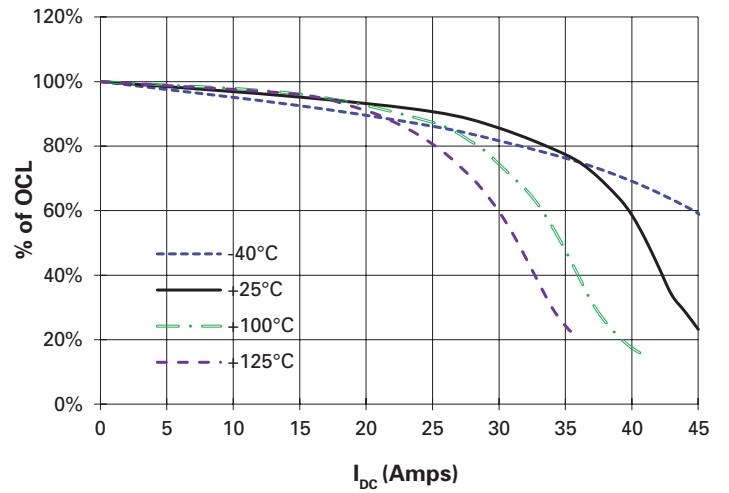
FP1108L4-R120-R



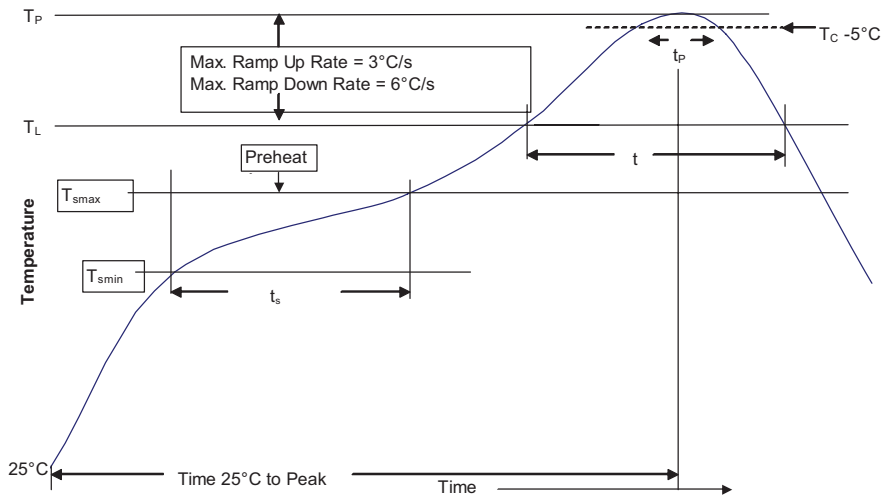
FP1108L4-R150-R



FP1108L4-R180-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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