

# FP1 108L1 and FP1 108L2

## High frequency, high current power inductors



### Description

- High current carrying capacity
- Low core loss
- Ultra low DCR
- Inductance range from 105nH to 150nH
- Current range from 48 to 81 amps
- 11.0 x 8.2mm footprint surface mount package in an 8.3mm 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>a</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) ±10% @ 20°C	K-factor <sup>7</sup>
<b>L1 Version</b>								
FP1108L1-R105-R	105	76	64	81	77	72	0.10	422
FP1108L1-R150-R	150	108	64	57	49	45	0.10	422
FP1108L1-R180-R	180	129	64	47	41	37	0.10	422
<b>L2 Version</b>								
FP1108L2-R150-R	150	108	48	55	50	46	0.18	390

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. 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 @ +75°C

6. I<sub>sat</sub>3: Peak current for approximately 20% rolloff @ +100°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

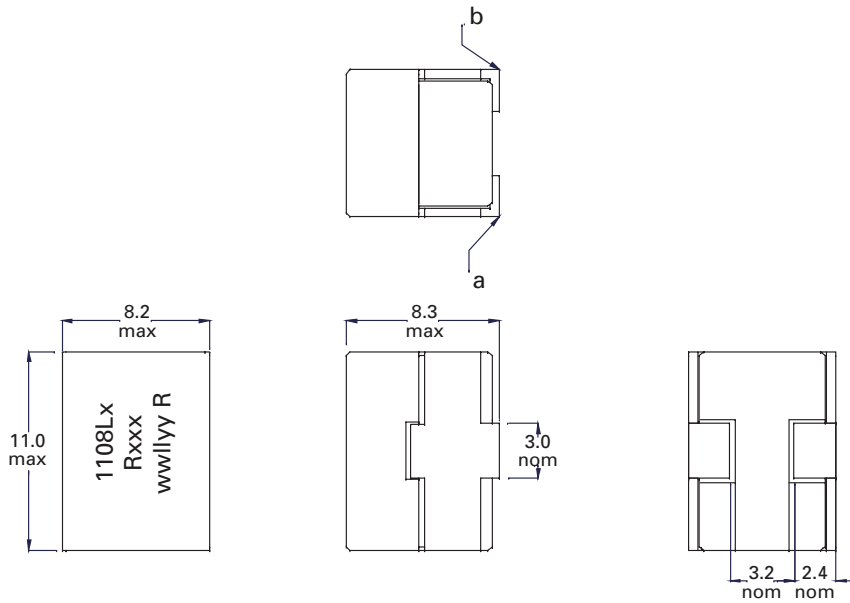
FP1108L = Product code and size

x= Version indicator

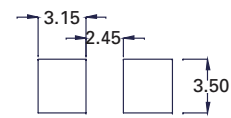
Rxxx= inductance value in μH, R= decimal point ,

-R suffix = RoHS compliant

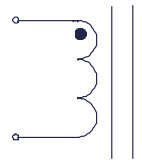
## Dimensions (mm)



## Recommended Pad Layout



## Schematic



Part marking: 1108Lx (x = Version indicator), Rxxx = Inductance value in μH (R= decimal point)

wwlyy = date code, R = revision level

All soldering surfaces to be coplanar within 0.1 millimeters

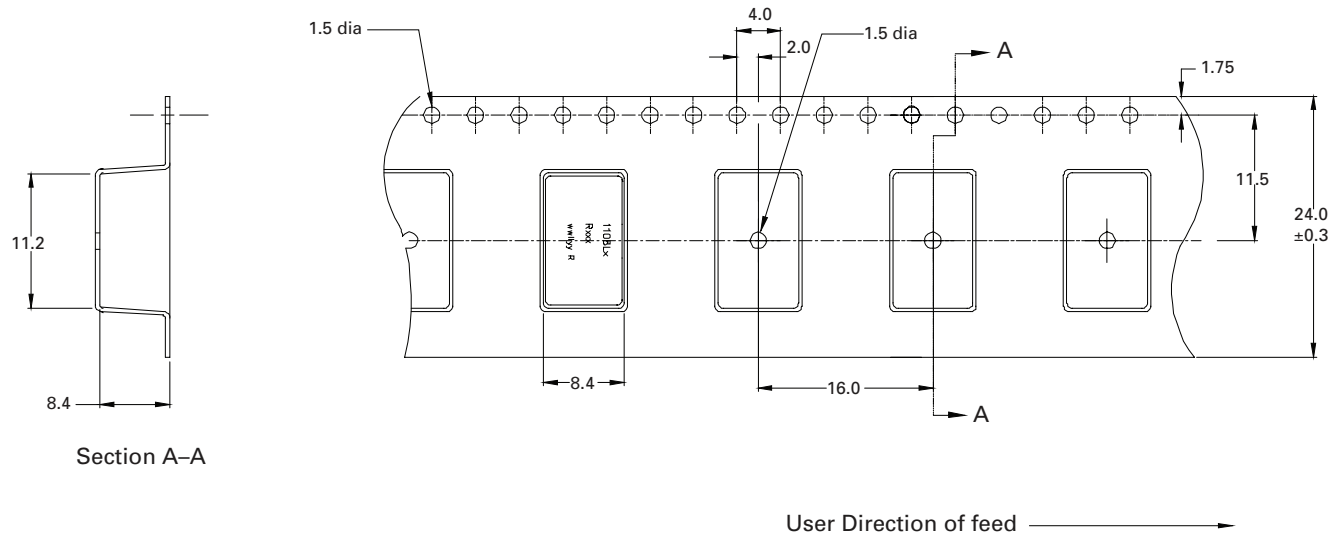
PCB tolerances are ±0.1 millimeters unless otherwise specified

DCR measured from point "a" to point "b"

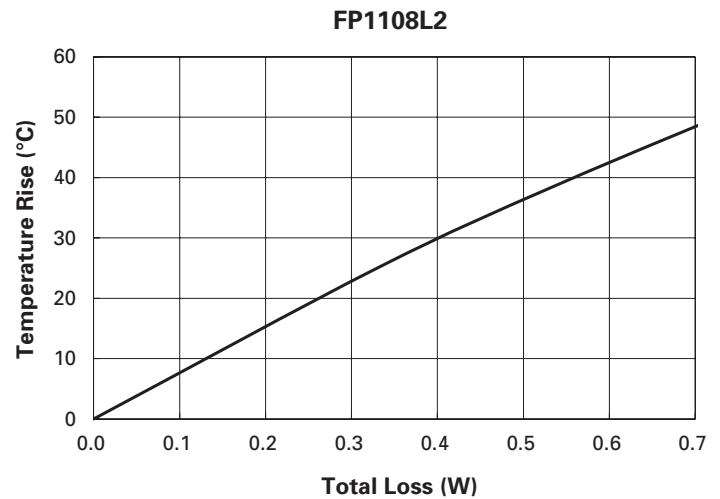
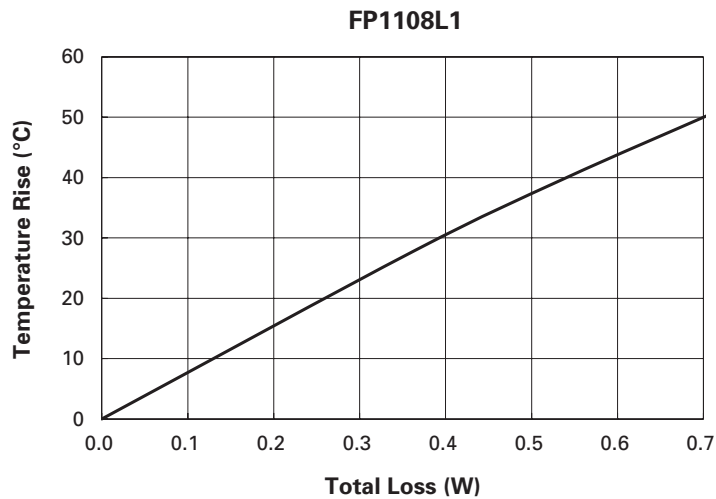
Do not route traces or vias underneath the inductor

### Packaging information (mm)

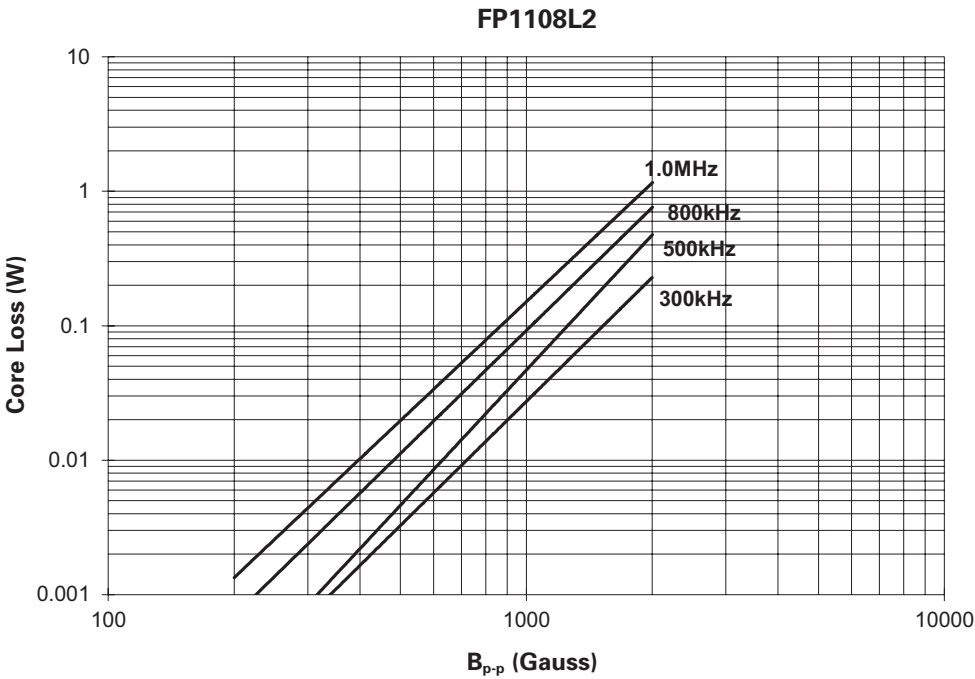
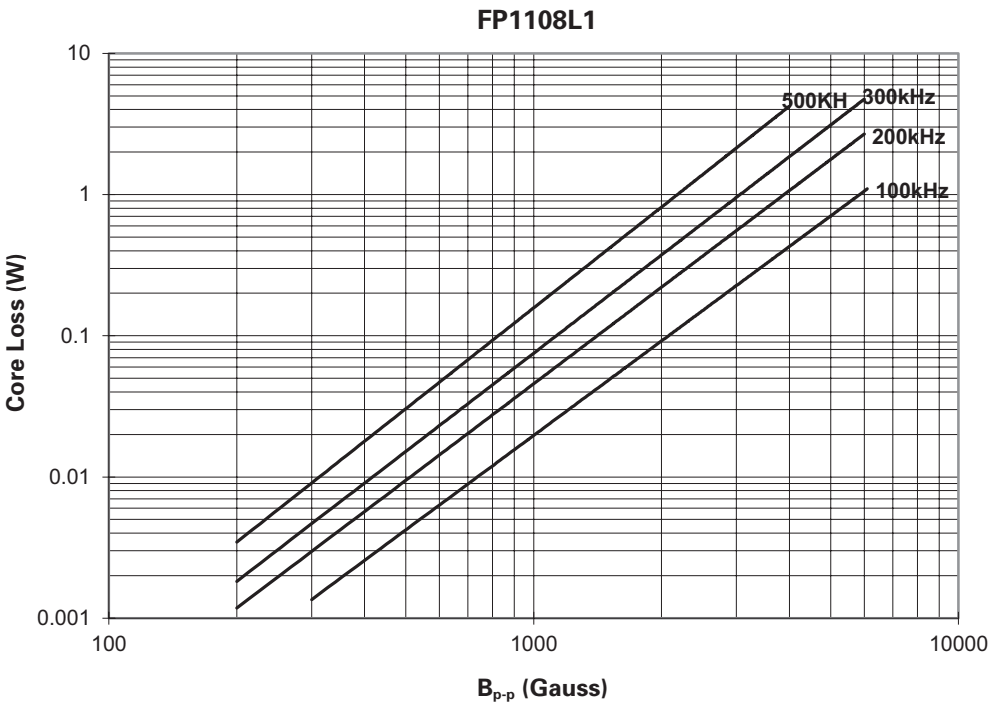
Supplied in tape and reel packaging, 450 parts per 13" diameter reel



### Temperature rise vs. total loss

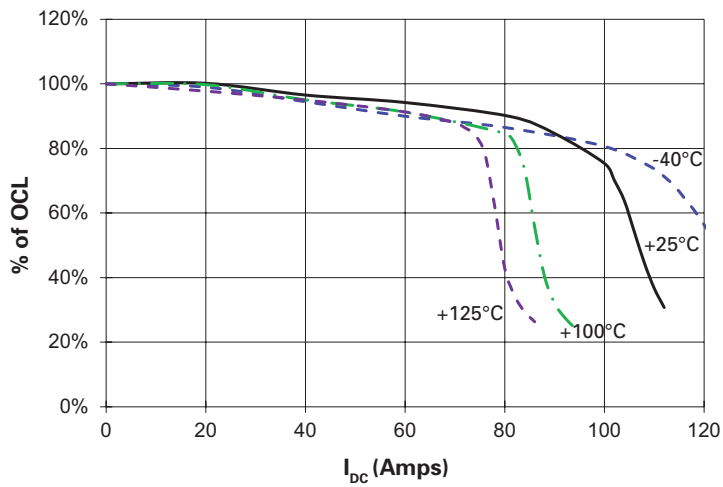


Core loss vs. B<sub>p-p</sub>

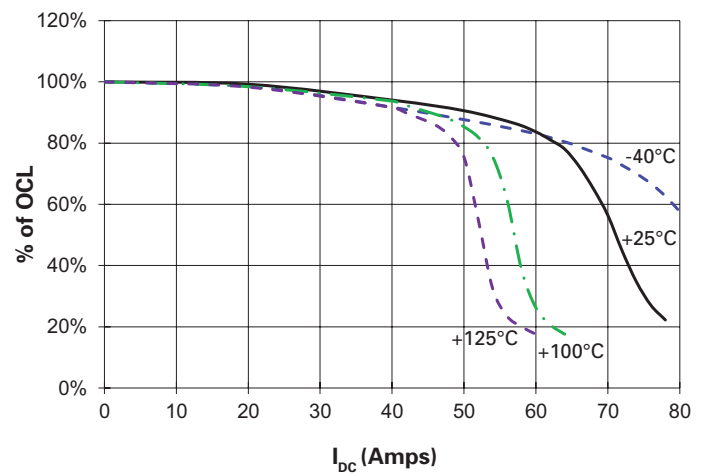


**Inductance characteristics**

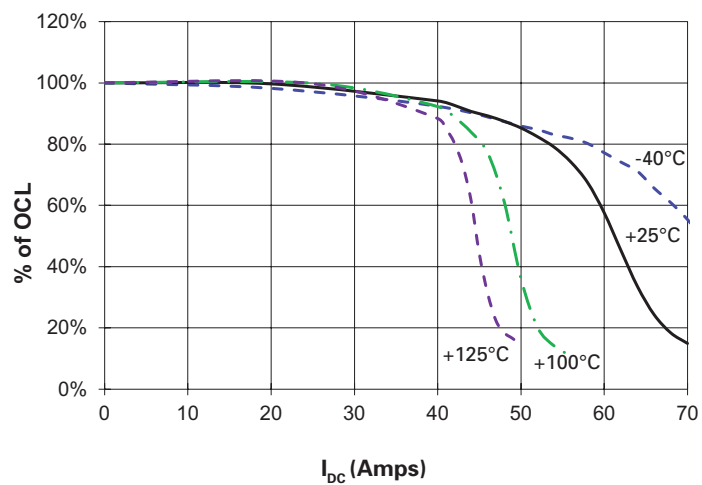
**FP1108L1-R105-R**



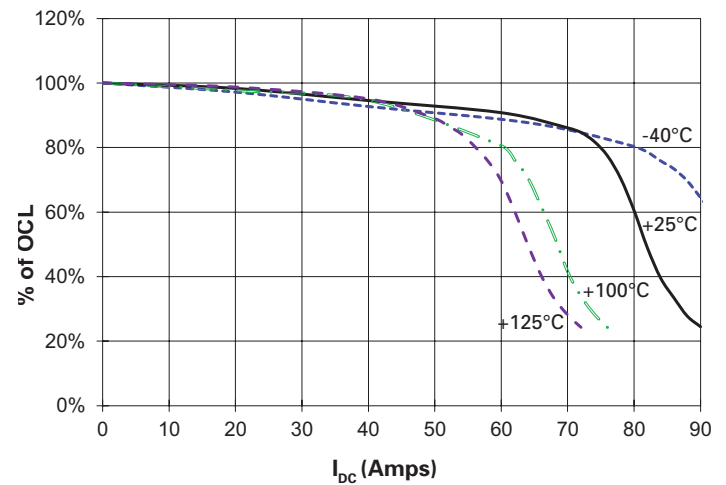
**FP1108L1-R150-R**



**FP1108L1-R180-R**



**FP1108L2-R150-R**



## Solder reflow profile

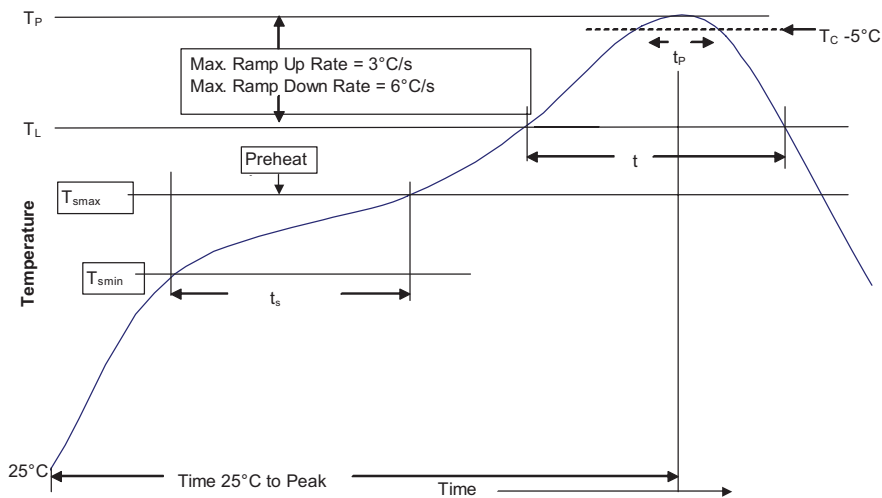


Table 1 - Standard SnPb Solder ( $T_c$ )

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 JEDEC 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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