

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 ^a	OCL ¹ (nH) ±10%	FLL ² (nH) minimum	I _{rms} ³ (amps)	I _{sat} ¹⁴ (amps)	I _{sat} ²⁵ (amps)	I _{sat} ³⁶ (amps)	DCR (mΩ) ±10% @ 20°C	K-factor ⁷
L1 Version								
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
L2 Version								
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_{sat}1, @ +25°C

3. I_{rms}: 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_{sat}1: Peak current for approximately 20% rolloff @ +25°C

5. I_{sat}2: Peak current for approximately 20% rolloff @ +75°C

6. I_{sat}3: Peak current for approximately 20% rolloff @ +100°C

7. K-factor: Used to determine B_{p-p} for core loss (see graph). B_{p-p} = K * L * ΔI * 10⁻³ B_{p-p}: (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

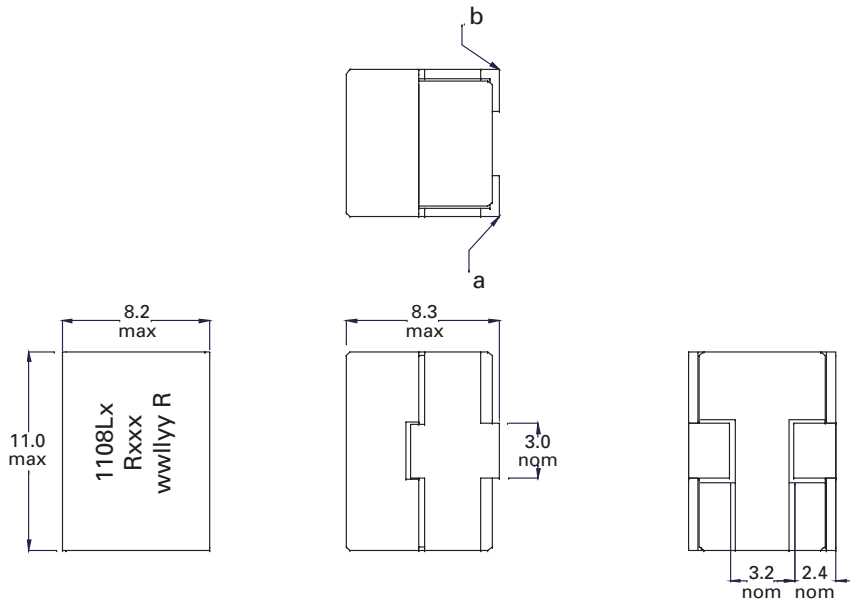
FP1108L = Product code and size

x= Version indicator

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

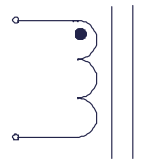
-R suffix = RoHS compliant

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

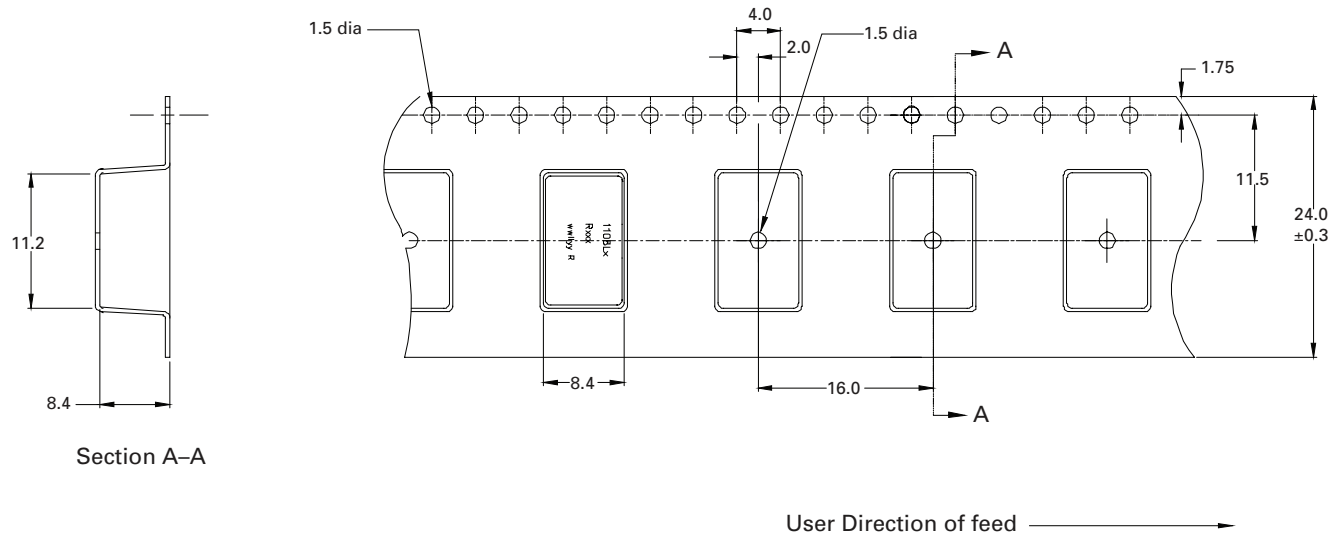
PCB tolerances are ±0.1 millimeters unless otherwise specified

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

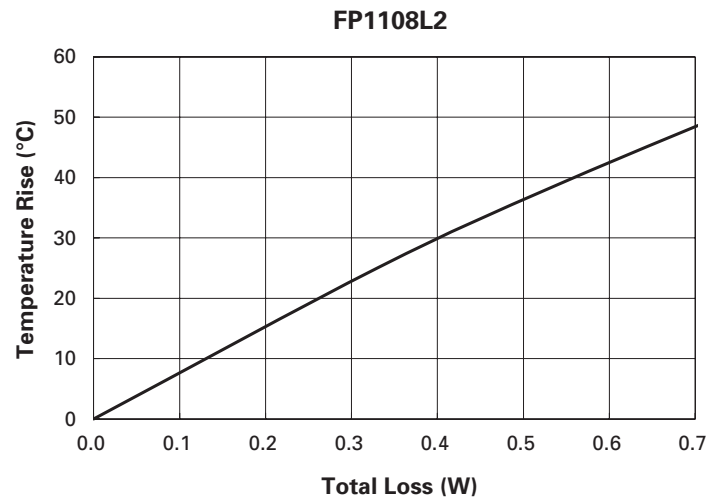
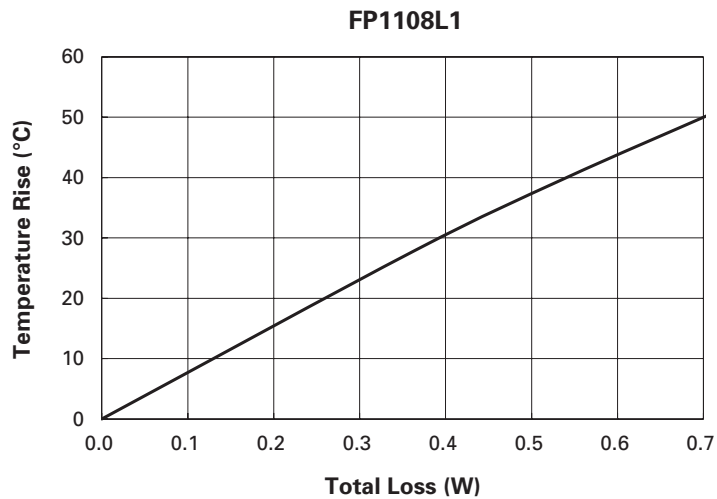
Do not route traces or vias underneath the inductor

Packaging information (mm)

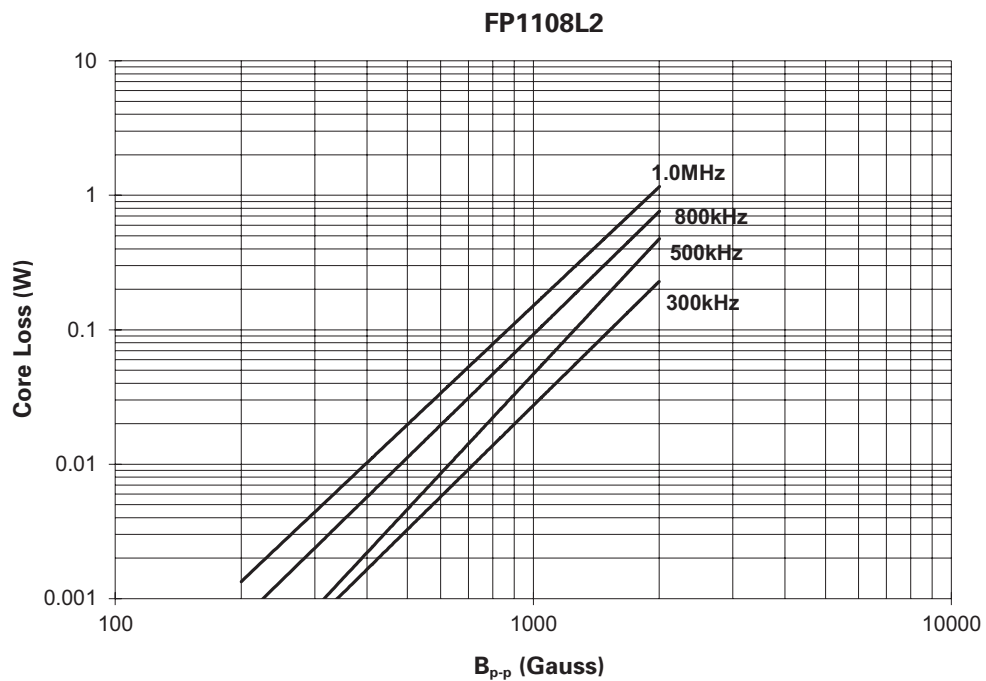
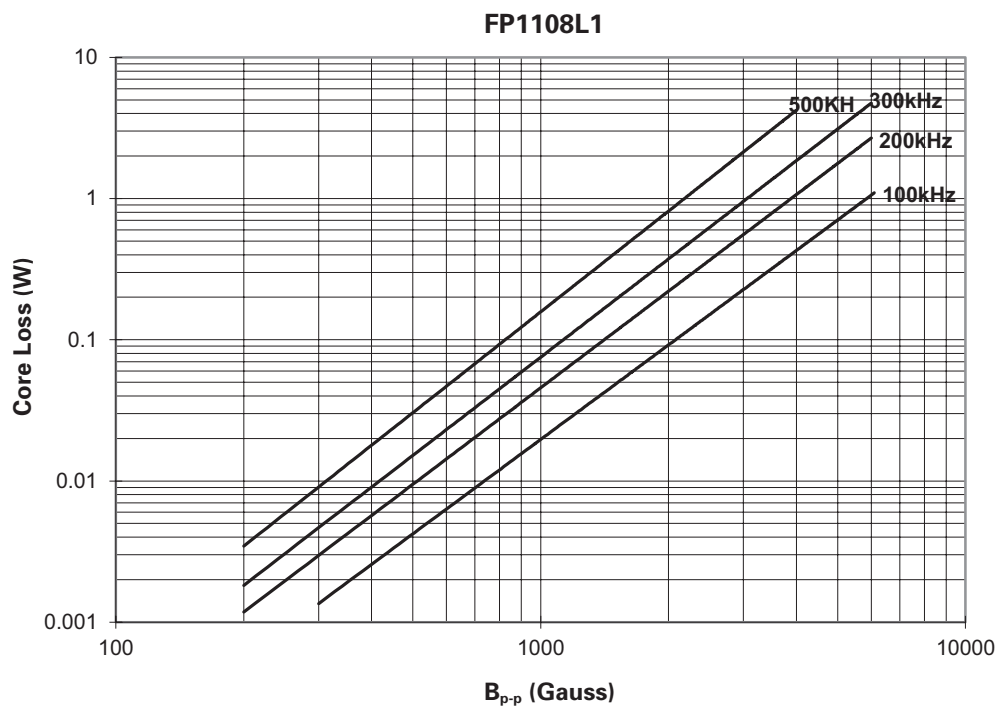
Supplied in tape and reel packaging, 450 parts per 13" diameter reel



Temperature rise vs. total loss

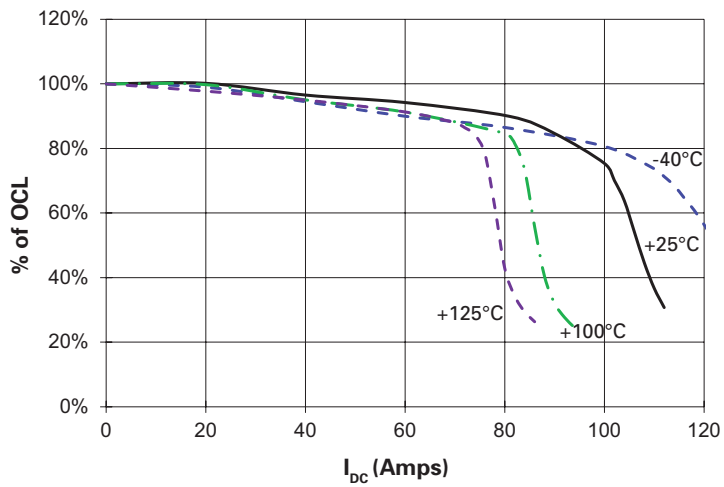


Core loss vs. B_{p-p}

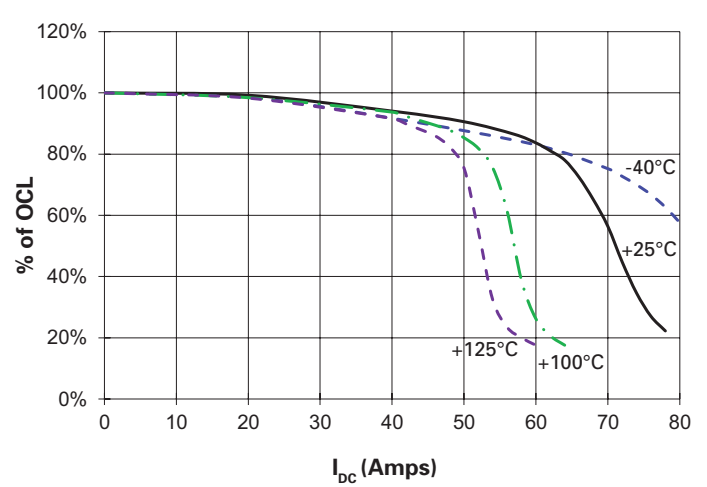


Inductance characteristics

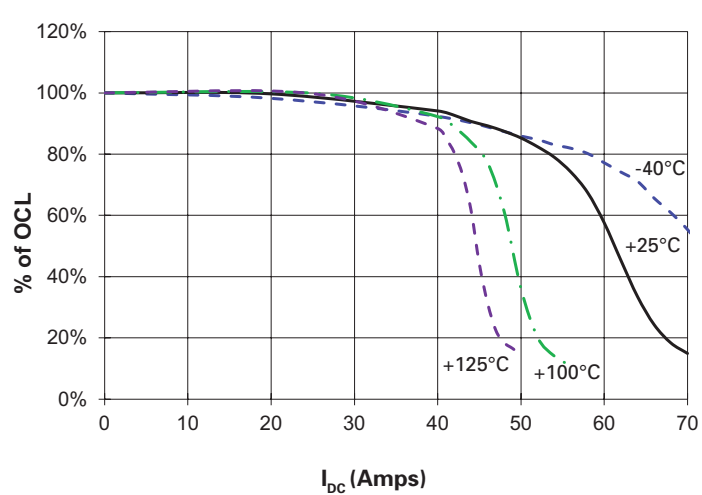
FP1108L1-R105-R



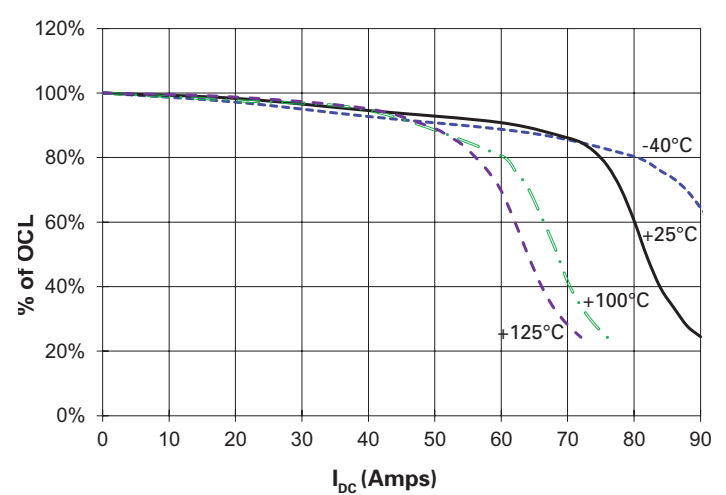
FP1108L1-R150-R



FP1108L1-R180-R



FP1108L2-R150-R



Solder reflow profile

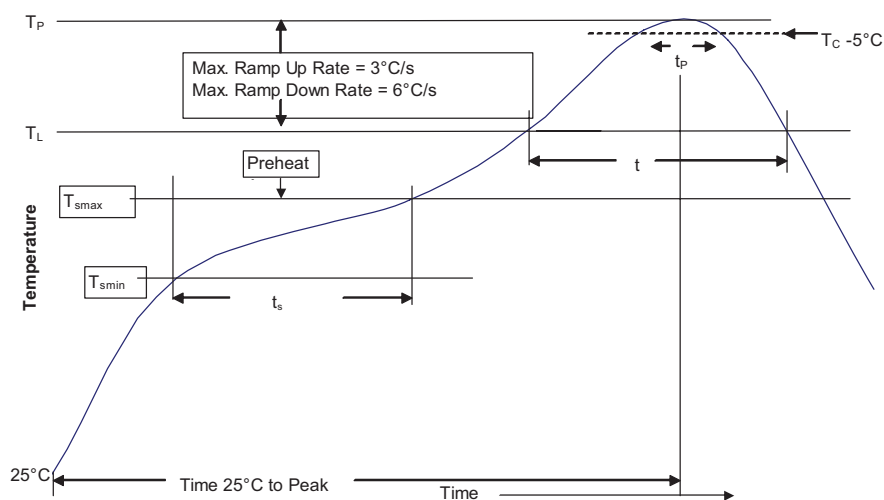


Table 1 - Standard SnPb Solder (T_c)

Package Thickness	Volume mm ³ <350	Volume mm ³ ≥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 ³ <350	Volume mm ³ 350 - 2000	Volume mm ³ >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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