FP1008L

High frequency, high current power inductors

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

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

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

Powering Business Worldwide

Product Specifications

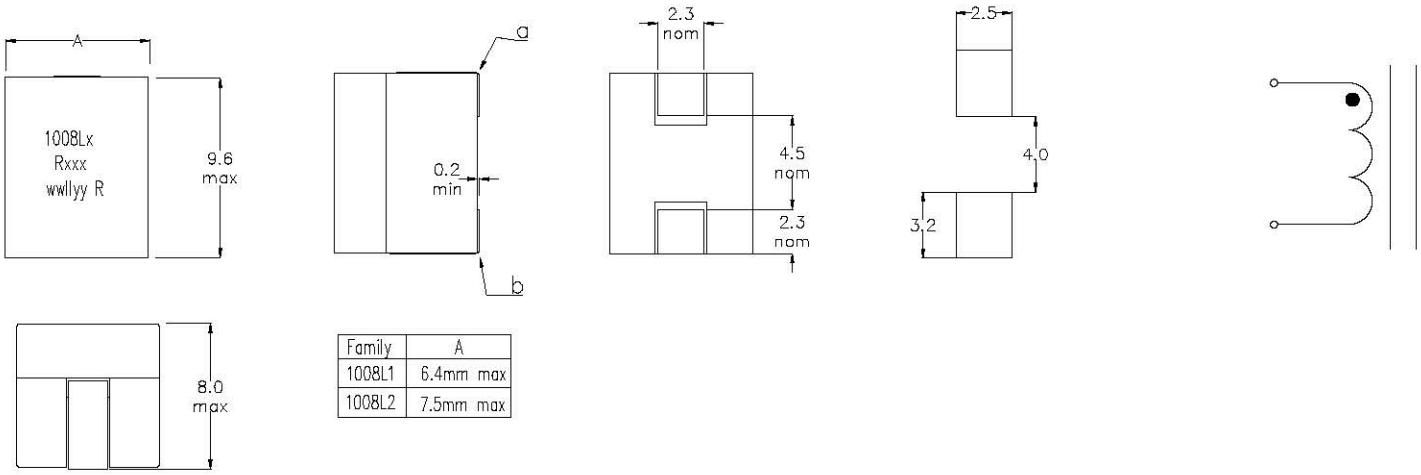
Part Number[8]	OCL[1] (nH) ±10%	FLL[2] (nH) minimum	I_{rms}[3] (amps)	$I_{sat}1$[4] (amps)	$I_{sat}2$[5] (amps)	$I_{sat}3$[6] (amps)	DCR (mΩ) @ 20°C	K-factor[7]
L1 Version								
FP1008L1-R100-R	100	72	65	75	65	63	0.17 ±5%	461
FP1008L1-R150-R	150	108	65	50	44	42	0.17 ±5%	461
L2 Version								
FP1008L2-R150-R	150	108	65	65	57	55	0.17 ±15%	411

1. Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.1Vrms, 0.0Adc, @ +25°C
2. Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1Vrms, @ $I_{sat}1$, @ +25ºC
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 @ +100°C
6. $I_{sat}3$: Peak current for approximately 20% rolloff @ +125°C
7. K-factor: Used to determine B_{p-p} for core loss (see graph). Bp-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: 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)

Recommended Pad Layout

Schematic



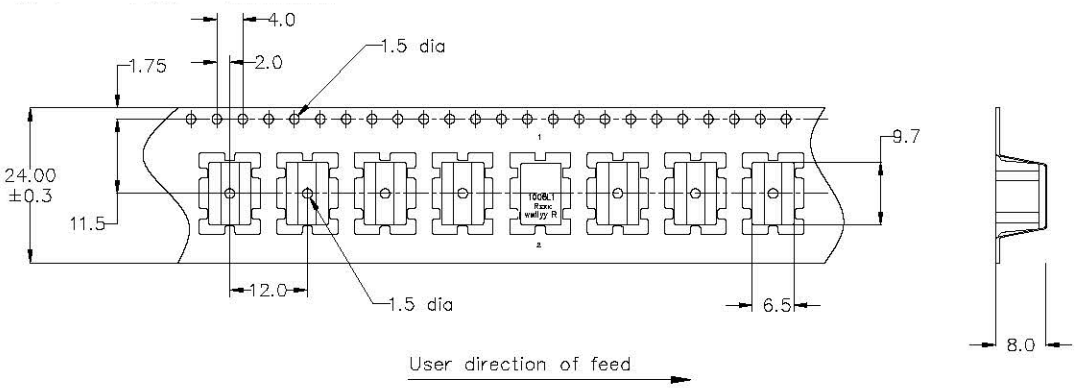
Family	A
1008L1	6.4mm max
1008L2	7.5mm max

Part marking: 1008Lx (x= Version indicator), Rxxx (xxx=inductance value in uH, R= decimal point), wwllyy= 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

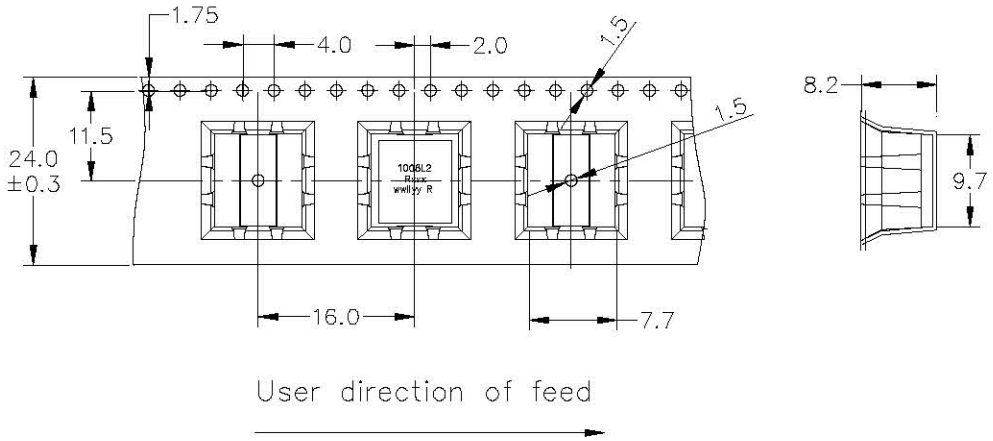
Packaging information (mm)

Supplied in tape and reel packaging
FP1008L1: 600 parts per 13" diameter reel
FP1008L2: 500 parts per 13" diameter reel

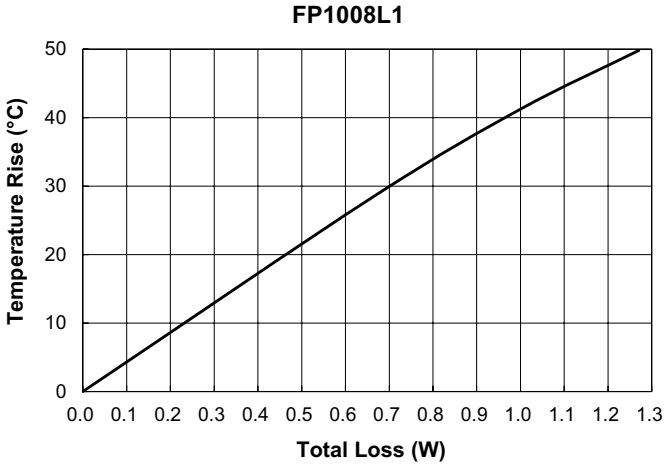
FP1008L1 (Drawing not to scale)

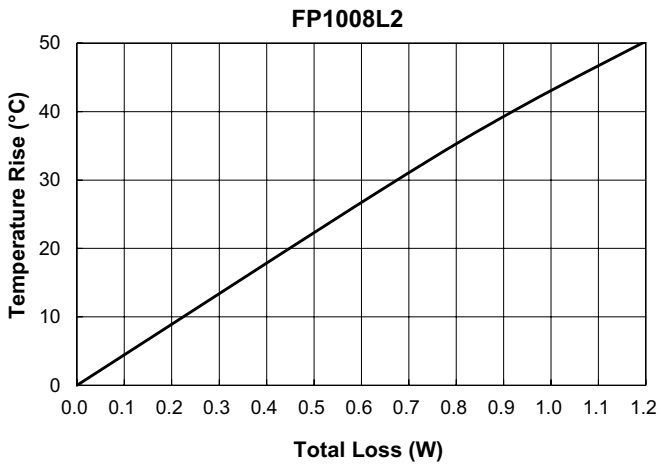


FP1008L2 (Drawing not to scale)

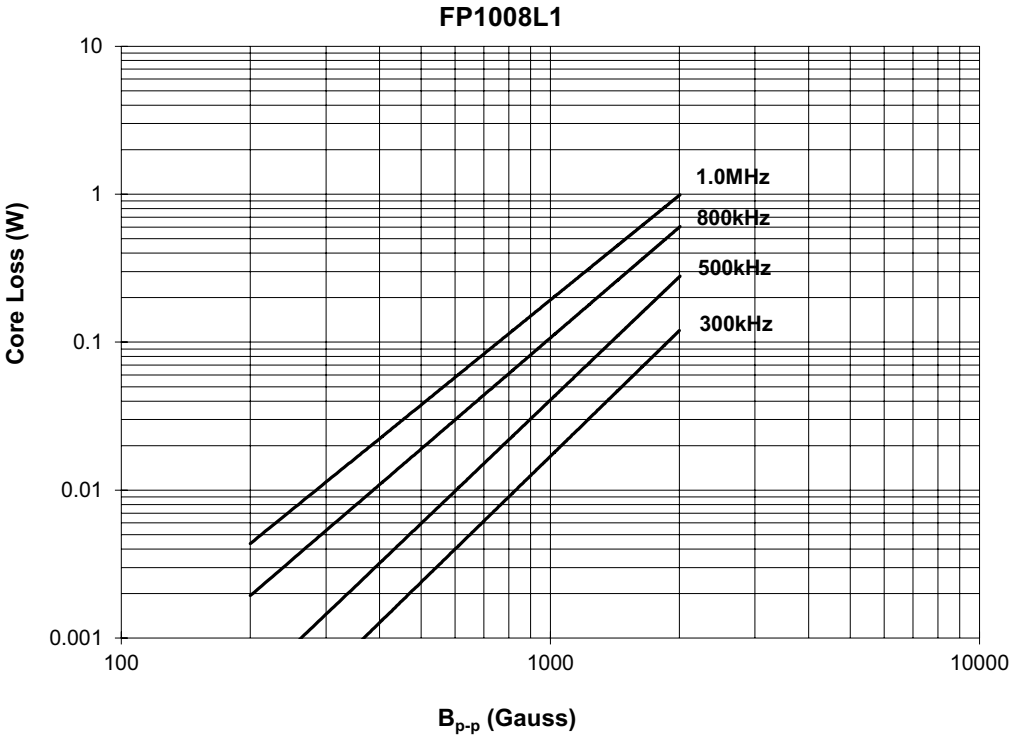


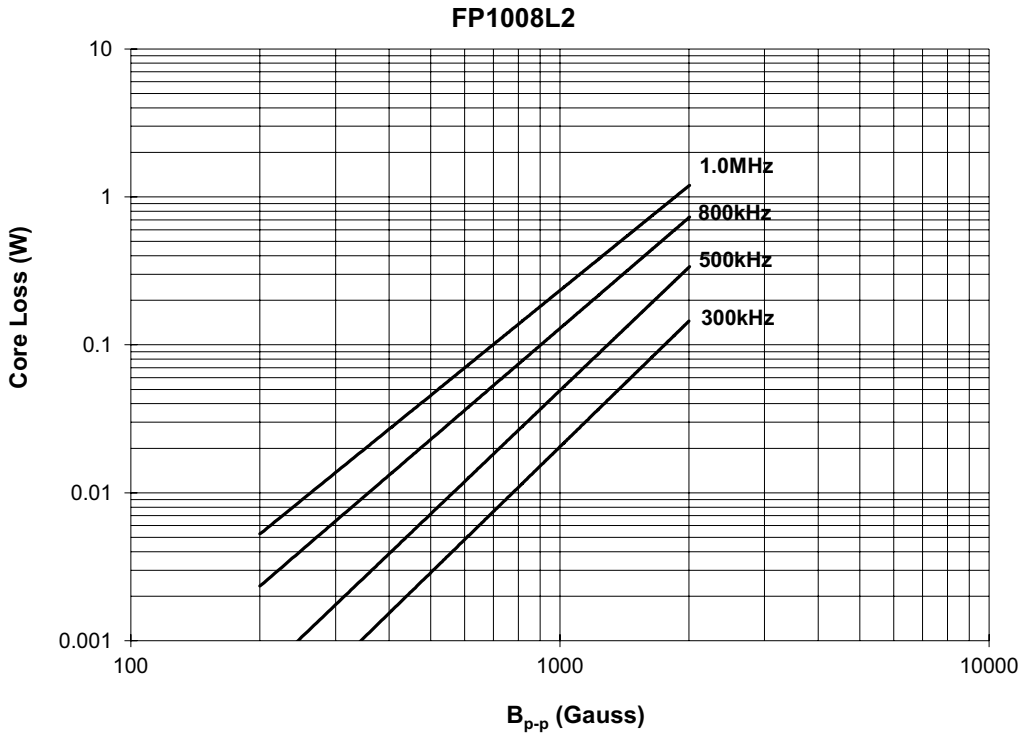
Temperature rise vs. total loss



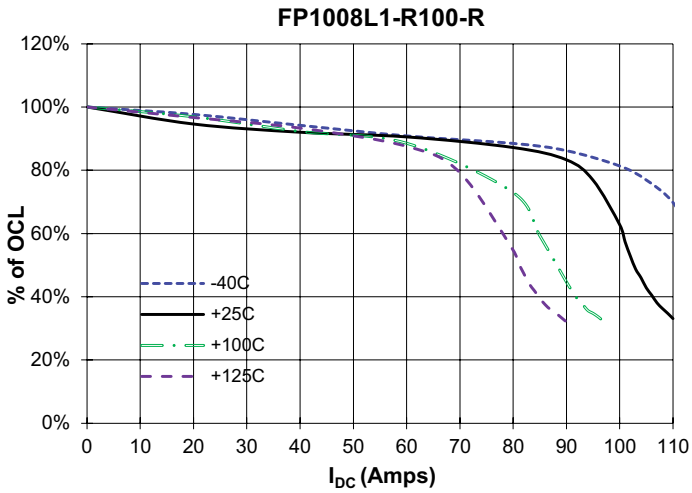


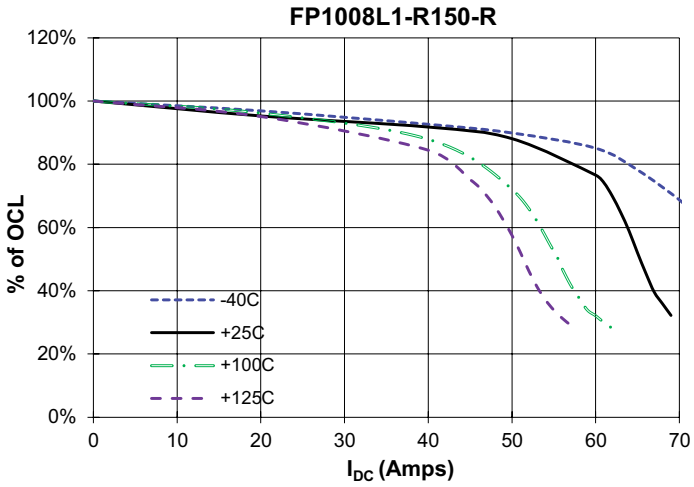
Core loss vs. B_{p-p}

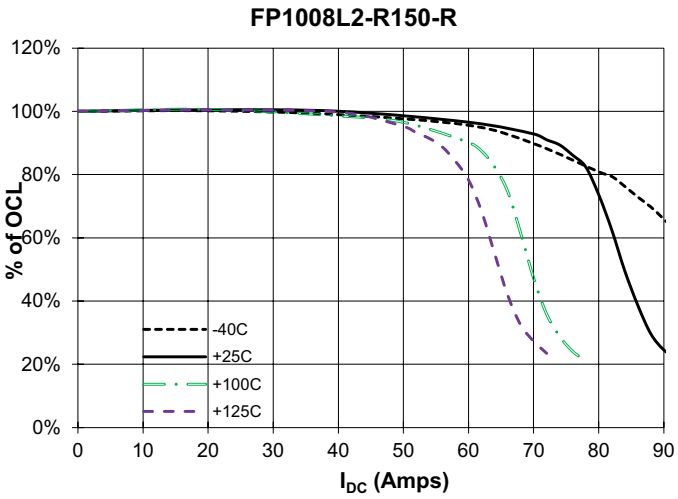




Inductance characteristics







Solder reflow profile

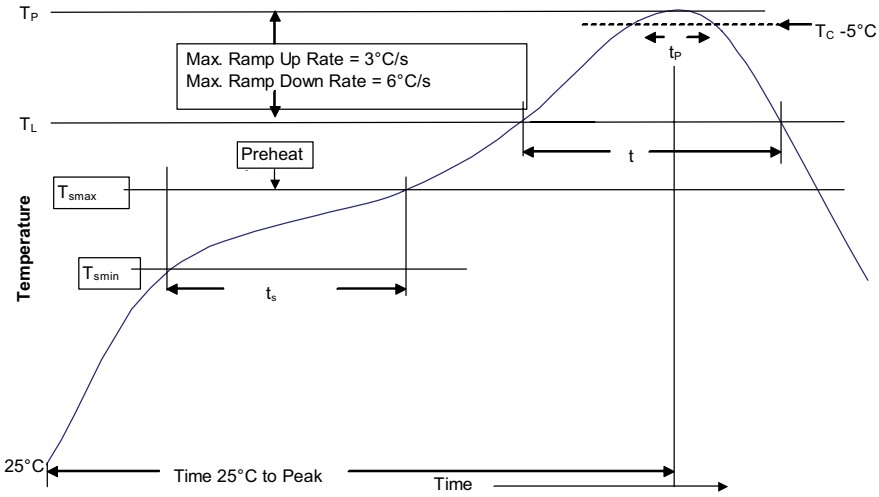


Table 1 - Standard SnPb Solder (T_C)

Package Thickness	Volume mm3 <350	Volume mm3 ≥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 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) Time at liquidous (t_L)		183°C 60-150 Seconds	217°C 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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