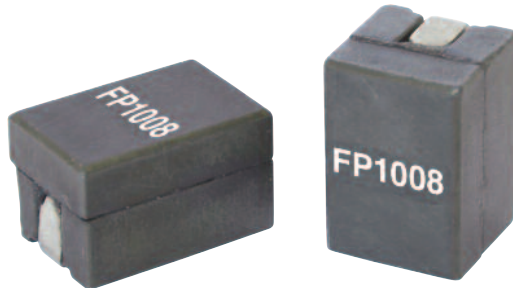


High Frequency, High Current Power Inductors

Flat-Pac™ FP1008 Series



Description

- Halogen free, lead free, RoHS compliant
- 125°C maximum total temperature operation
- 10.8 x 8.0 x 8.0mm maximum surface mount package
- Ferrite core material
- Controlled DCR for sensing circuits
- Inductance range from 114nH to 180nH
- Current range from 63 to 106 Amps

Applications

- Multi-phase regulators
- Voltage Regulator Modules (VRMs)
- Desktop and server VRMs and EVRDs
- Notebook regulators
- 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 + self-temperature rise)
- Solder reflow temperature: J-STD-020D compliant

Packaging

- Supplied in tape-and-reel packaging, 350 parts per 13" diameter reel

Product Specifications

| Part Number ⁹ | OCL ¹ (nH)±10% | FLL min. ² (nH) | I _{rms} ³ (Amps) | I _{sat} 1 ⁴ (Amps) | I _{sat} 2 ⁵ (Amps) | I _{sat} 3 ⁶ (Amps) | I _{sat} 4 ⁷ (Amps) | DCR (mΩ) @ 20°C | K-factor ⁸ |
|--------------------------|------------------------------|-------------------------------|-----------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|--------------------|-----------------------|
| FP1008-120-R | 114 | 82 | 63 | 106 | 100.7 | 97 | 88 | 0.17±5% | 366 |
| FP1008-150-R | 144 | 104 | | 82 | 78 | 75 | 68 | | 366 |
| FP1008-180-R | 180 | 130 | | 64 | 60.8 | 58.6 | 53 | | 366 |

1. Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.1V_{rms}, 0.0A_{dc} @ 25°C

2. Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1V_{rms}, I_{sat}1

3. I_{rms}: DC current for an approximate temperature rise of 30°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 @ 85°C

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

7. I_{sat}4: Peak current for approximately 20% rolloff @ 125°C

8. K-factor: Used to determine B_{p-p} for core loss (see graph).

$B_{p-p} = K * L * \Delta I * 10^{-3}$. B_{p-p}:(Gauss), K: (K-factor from table), L: (Inductance in nH), ΔI (Peak-to-peak ripple current in Amps).

9. Part Number Definition: FP1008-xxx-R

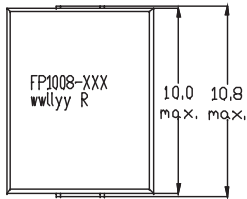
- FP1008= Product code and size

- xxx= Inductance value in nH

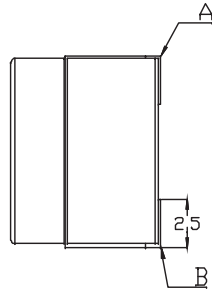
- "-R" suffix = RoHS compliant

Dimensions - mm

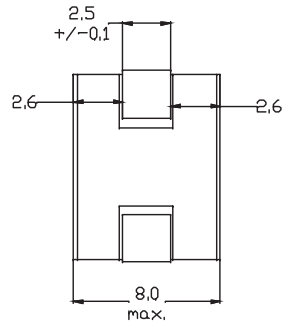
Top View



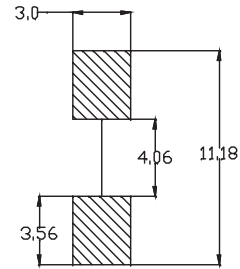
Side View



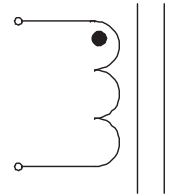
Bottom View



Recommended Pad Layout

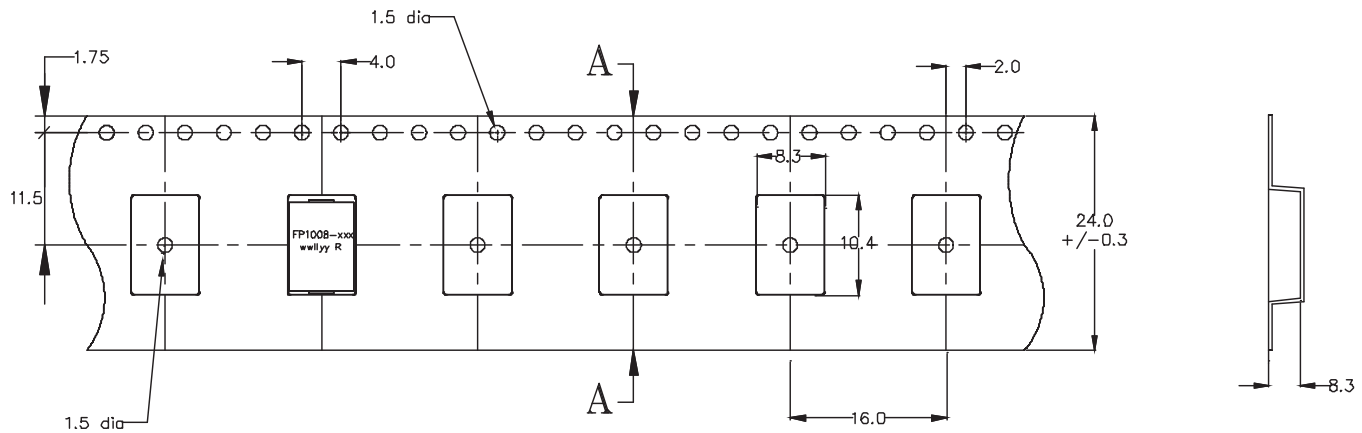


Schematic



DCR measured from point "A" to point "B"
 Part marking: FP1008-xxx xxx = Inductance value in nH
 wwlly= date code, R= revision level
 Tolerances are +/- 0.205 millimeters unless stated otherwise.
 All soldering surfaces to be coplanar within 0.1 millimeters.

Packaging Information - mm

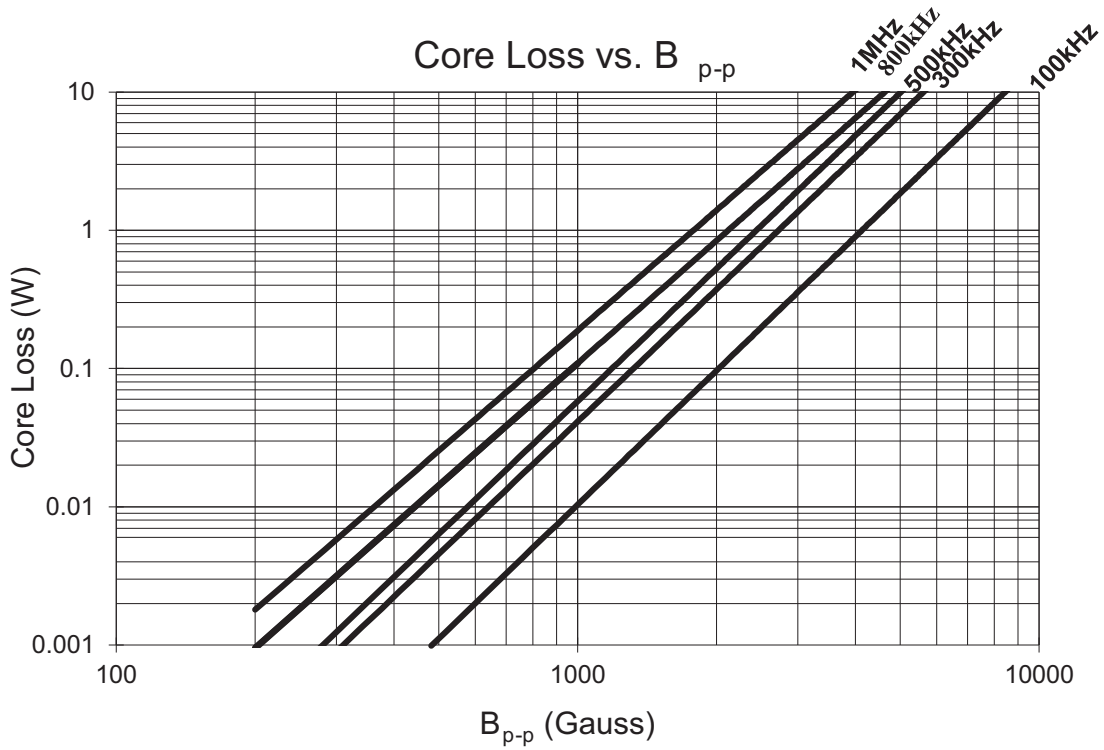


User Direction of Feed →

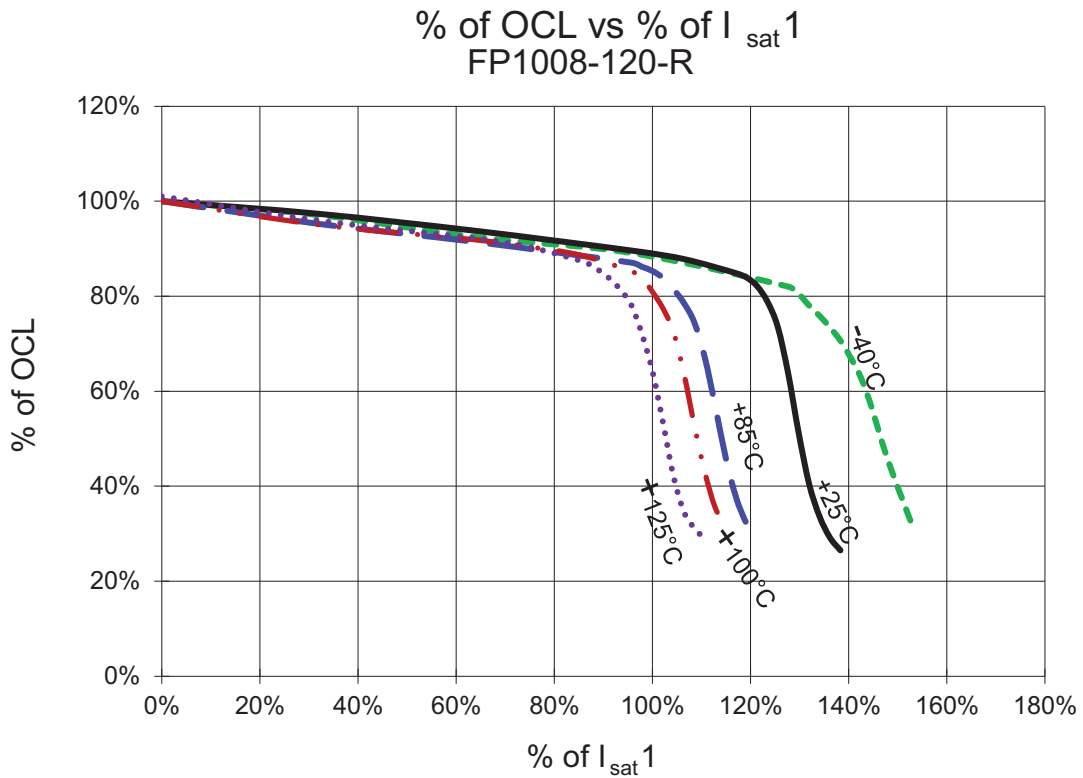
Section A-A

Supplied in tape-and-reel packaging, 350 parts on a 13" diameter reel.

Core Loss

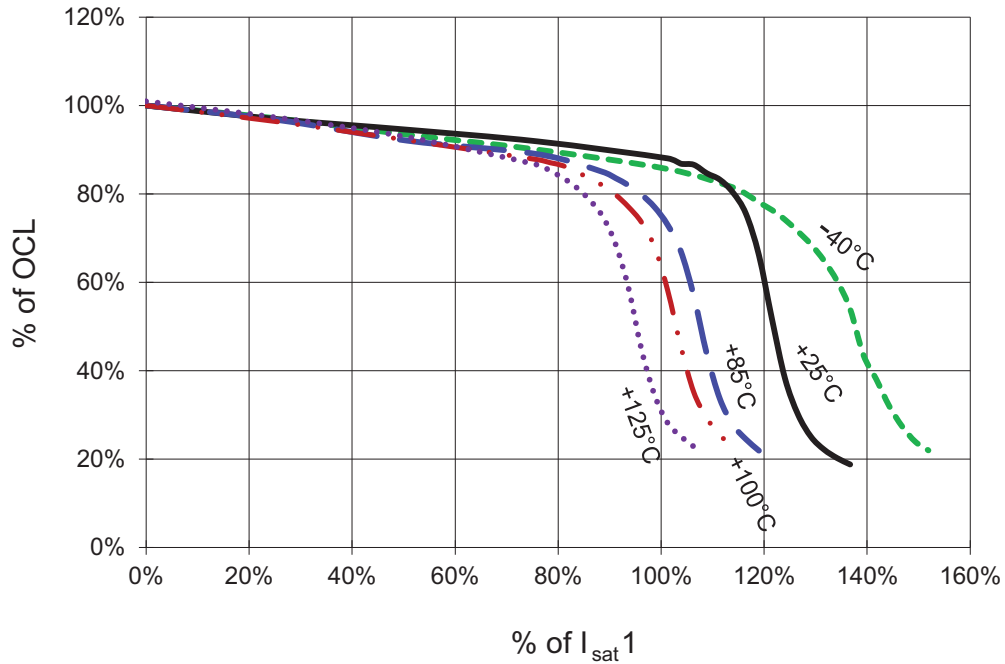


Inductance Characteristics

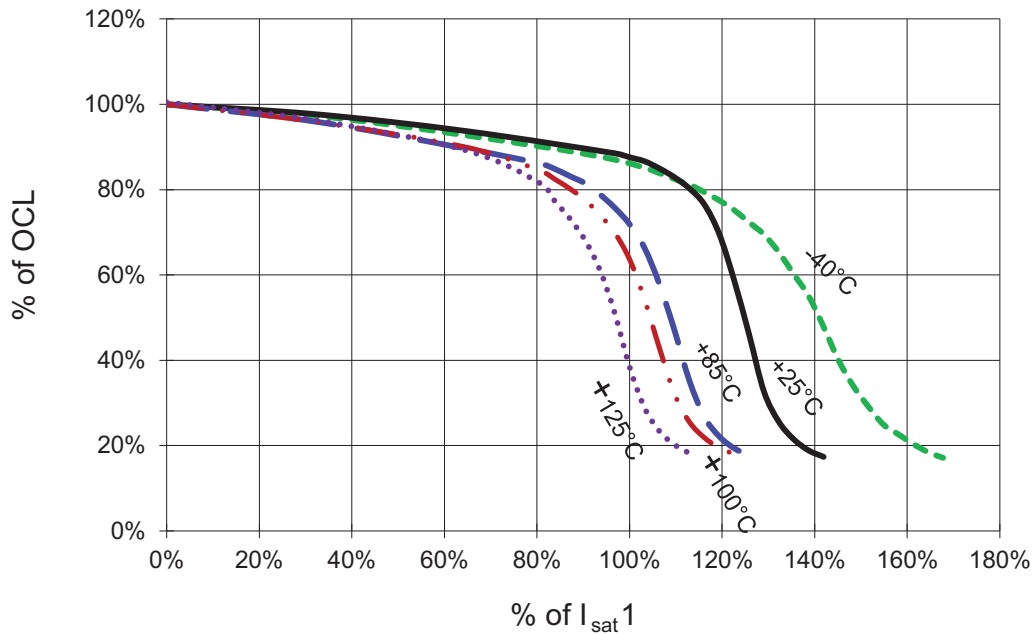


Inductance Characteristics

% of OCL vs % of I_{sat1}
FP1008-150-R



% of OCL vs % of I_{sat1}
FP1008-180-R



Solder Reflow Profile

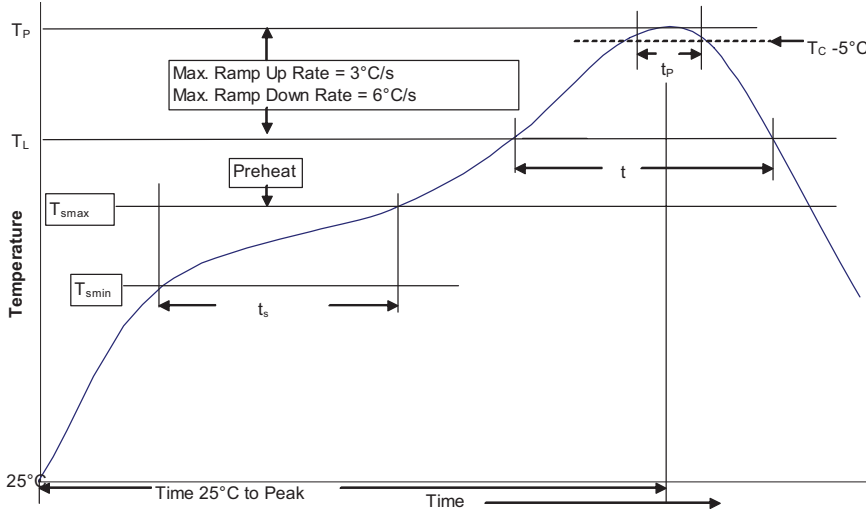


Table 1 - Standard SnPb Solder (T_c)

| Package Thickness | Volume mm^3 <350 | Volume mm^3 ≥ 350 |
|---------------------|---------------------------|---------------------------------|
| <2.5mm | 235°C | 220°C |
| $\geq 2.5\text{mm}$ | 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) | 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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