

Coiltronics FP1008 Family

High frequency, high current power inductors



Applications

- Multi-phase and Vcore regulators
- Voltage Regulator Modules (VRMs)
- Desktop and server VRMs and EVRDs
- Laptop and 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

Product description

- High current carrying capacity
- Low core loss
- Controlled DCR for sensing circuits
- Inductance range from 120nH to 180nH
- Current range from 63 to 100 Amps
- 10.8 x 8.0mm footprint surface mount package in a 8.0mm height
- Ferrite core material
- Halogen free, lead free, RoHS compliant



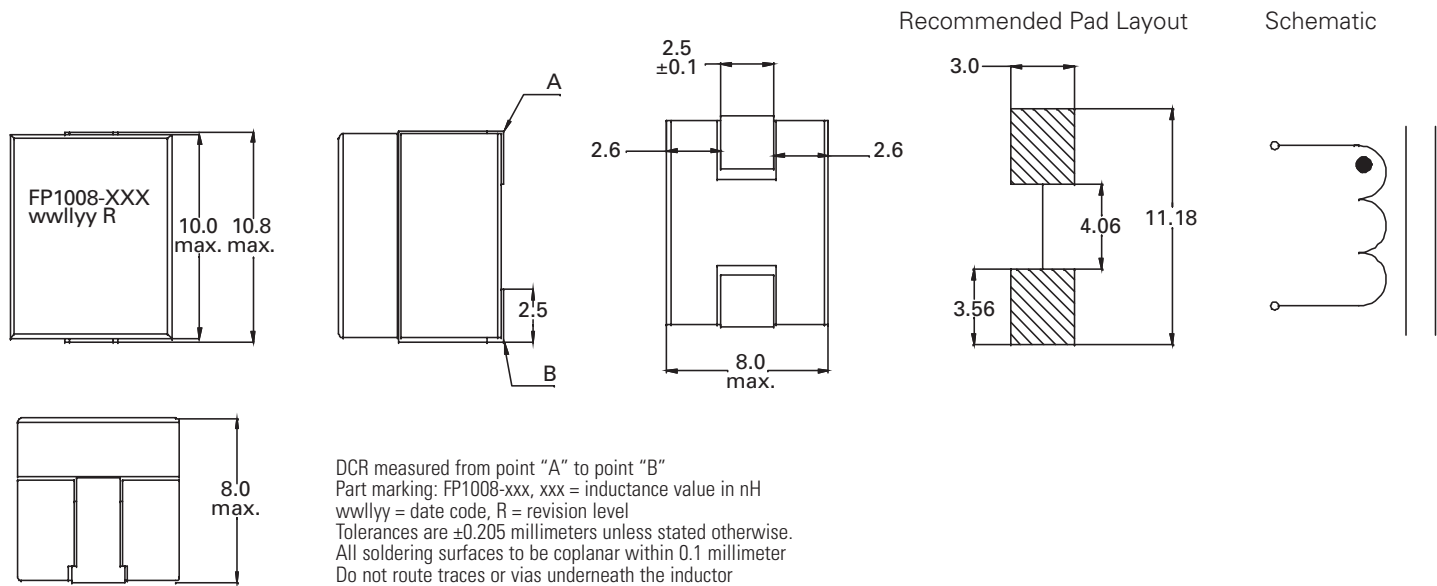
Product specifications

| Part Number ⁹ | 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) | I _{sat} 4 ⁷ (amps) | DCR (mΩ) @ 20°C ±5% | K-factor ⁸ |
|--------------------------|------------------------------|----------------------------------|---|---|---|---|---|------------------------|-----------------------|
| FP1008-120-R | 120 | 82 | 63 | 100 | 95.0 | 91.0 | 82 | 0.17 | 366 |
| FP1008-150-R | 150 | 104 | 63 | 82 | 78.0 | 75.0 | 68 | 0.17 | 366 |
| FP1008-180-R | 180 | 130 | 63 | 64 | 60.8 | 58.6 | 53 | 0.17 | 366 |

- Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.1V_{rms}, 0.0Adc @ 25°C
- Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1V_{rms}, I_{sat}1
- 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.
- I_{sat}1: Peak current for approximately 20% rolloff @ 25°C
- I_{sat}2: Peak current for approximately 20% rolloff @ 85°C
- I_{sat}3: Peak current for approximately 20% rolloff @ 100°C

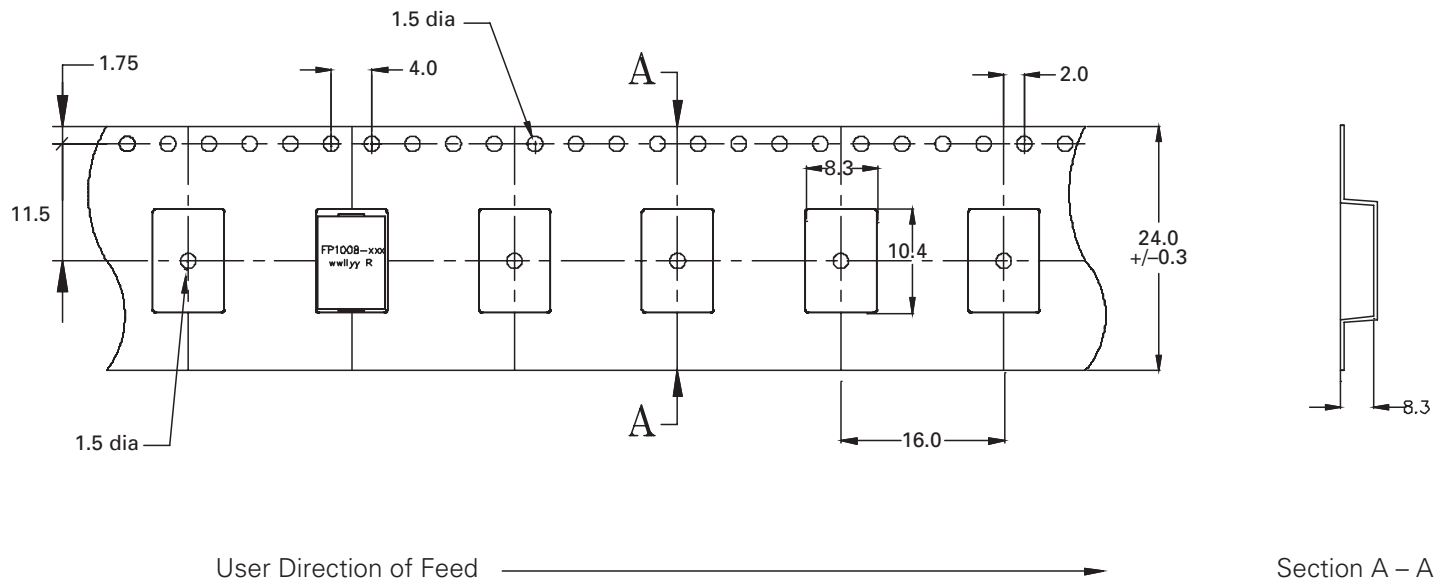
- I_{sat}4: Peak current for approximately 20% rolloff @ 125°C
- K-factor: Used to determine B_{pp} for core loss (see graph).
B_{pp} = K * L * ΔI * 10⁻³. B_{pp}(Gauss), K: (K-factor from table),
L: (Inductance in nH), ΔI (Peak-to-peak ripple current in Amps).
- Part Number Definition: FP1008-xxx-R
- FP1008= Product code and size
- xxx= Inductance value in nH
- "-R" suffix = RoHS compliant

Dimensions (mm)

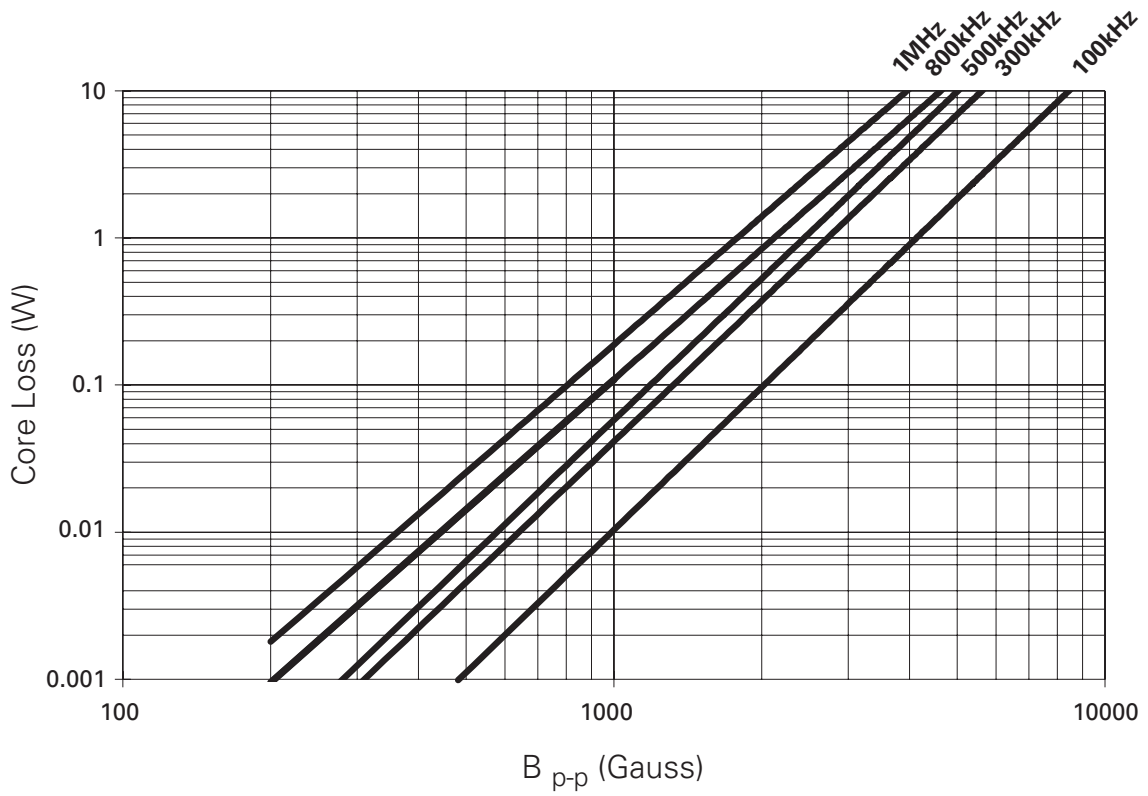


Packaging information (mm)

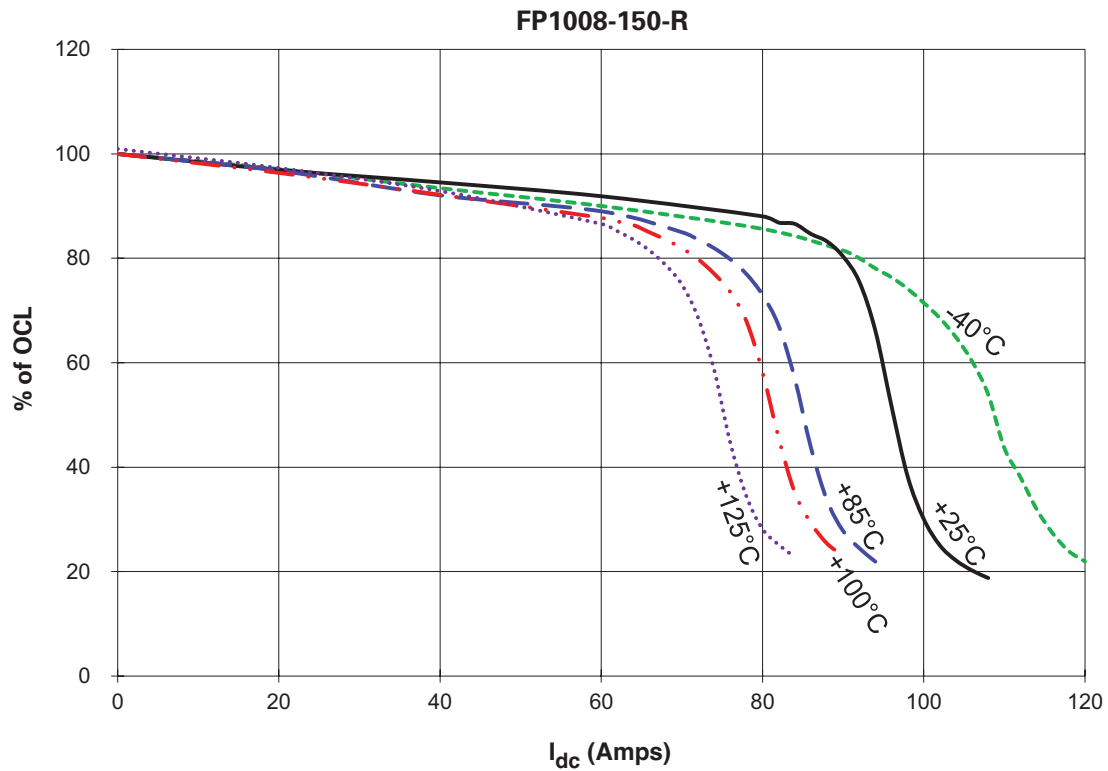
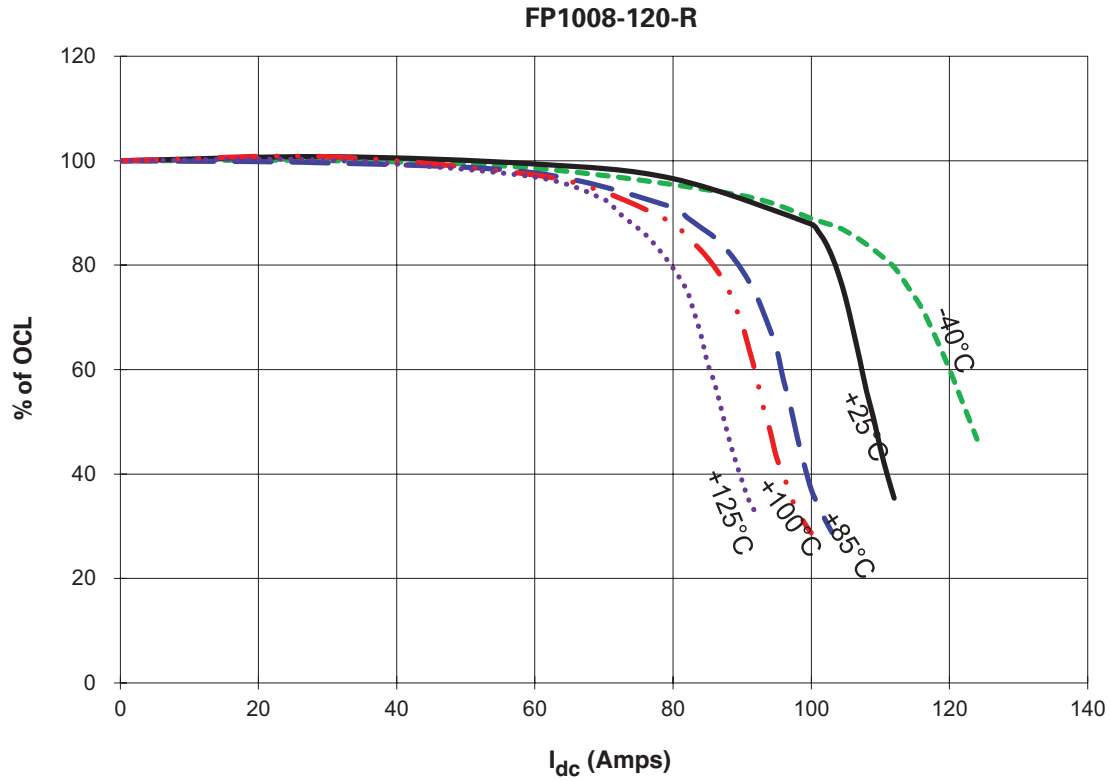
Supplied in tape-and-reel packaging, 350 parts on a 13" diameter reel.



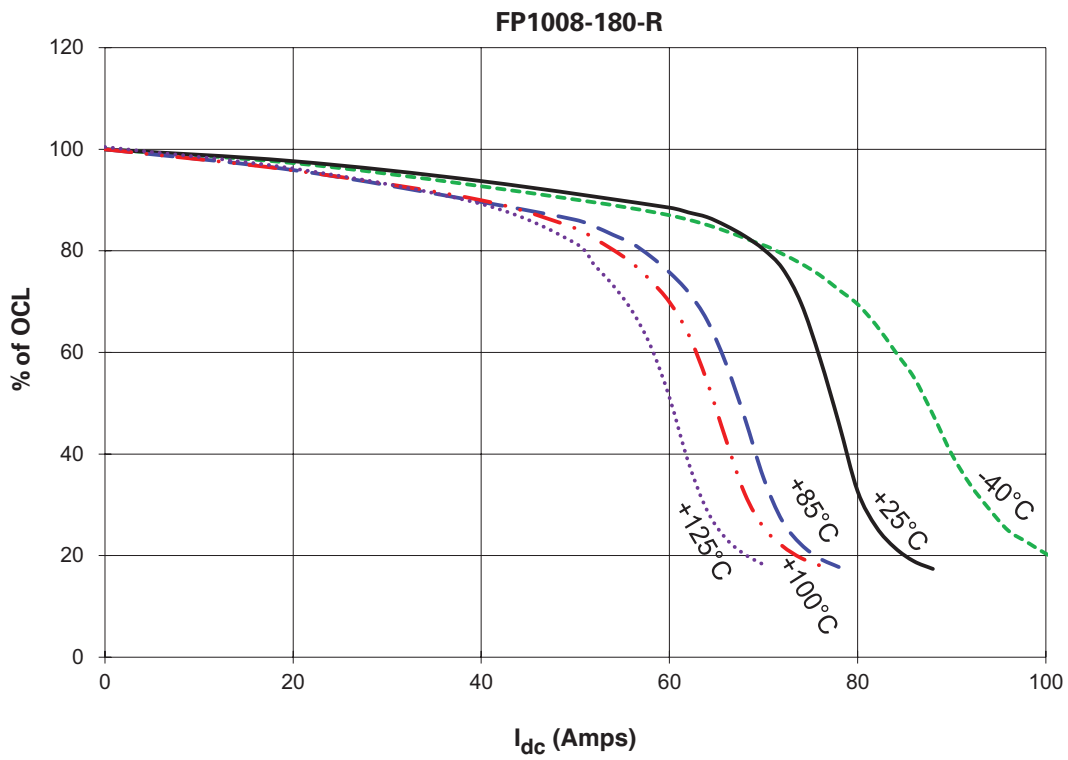
Core loss vs. B_{p-p}



Inductance characteristics



Inductance characteristics



Solder reflow profile

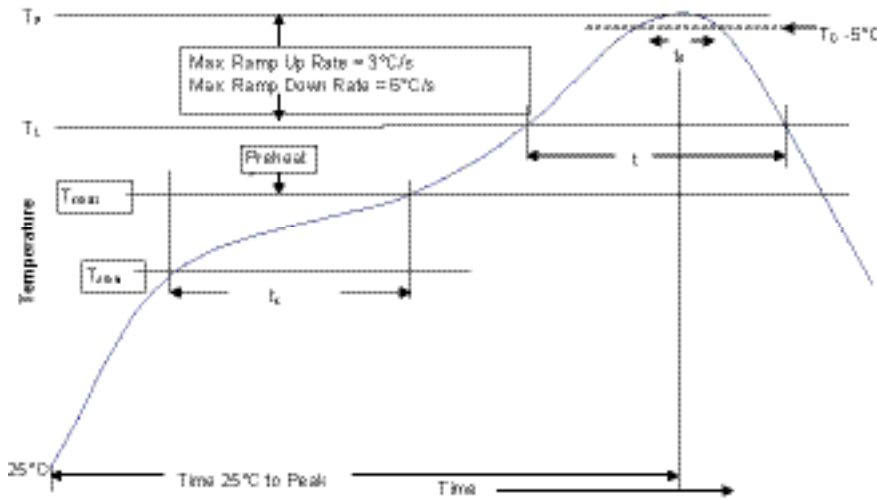


Table 1 - Standard SnPb Solder (T_C)

| Package Thickness | Volume mm^3 <350 | Volume mm^3 \geq 350 |
|-------------------|---------------------------|---------------------------------|
| <2.5mm) | 235°C | 220°C |
| \geq 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) | 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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