

High Current, High Frequency, Power Inductors

FLAT-PAC™ FP1007 Series



Applications:

- Multi-phase regulators
- Voltage Regulator Module (VRM)
- 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

Environmental Data:

- Storage temperature range: -40°C to +125°C
- Operating temperature range: -40°C to +125°C (Range is application specific)
- Solder reflow temperature: J-STD-020D compliant

Packaging:

- Supplied in tape and reel packaging on 13" diameter reel
- FP1007R1 700 parts per reel
- FP1007R2 750 parts per reel

Description:

- Halogen free
- 125°C maximum total temperature operation
- 8.0 x 10.41 x 7.0mm surface mount package
- Ferrite core material
- High current carrying capacity, Low core losses
- Controlled DCR tolerance for sensing circuits
- Inductance range from 120nH to 300nH
- Current range from 32 Amps to 81 Amps
- Frequency range up to 2MHz
- RoHS compliant

Product Specifications

Part Number ⁷	OCL ¹ ± 10% (nH)	FLL ² Min. (nH)	I _{rms} ³ (Amps)	I _{sat} ⁴ @ 25°C (Amps)	I _{sat} ⁵ @ 125°C (Amps)	DCR (mΩ) @ 20°C	K-factor ⁶
R1 Version							
FP1007R1-R12-R	120	86	60	81	65	0.29 ± 10%	371
FP1007R1-R14-R	140	100		72	56		371
FP1007R1-R17-R	170	122		58	46		371
FP1007R1-R22-R	215	155		50	36		371
FP1007R1-R30-R	300	216		32	26		371
R2 Version							
FP1007R2-R12-R	120	86	51	81	65	0.48 ± 8%	368
FP1007R2-R14-R	140	100		72	56		368
FP1007R2-R17-R	170	122		58	46		368
FP1007R2-R22-R	215	155		50	36		368
FP1007R2-R30-R	300	216		32	26		368

1 Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.10V_{rms}, 0.0Adc

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 40°C without core loss. Derating is necessary for AC currents. PCB pad layout, trace thickness and width, air-flow and proximity of other heat generating components will affect the temperature rise. It is recommended the part temperature not exceed 125°C under worst case operating conditions verified in the end application.

4 I_{sat}¹: Peak current for approximately 20% rolloff at +25°C.

5 I_{sat}²: Peak current for approximately 20% rolloff at +125°C.

6 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).

7 Part Number Definition: FP1007Rx-Rxx-R

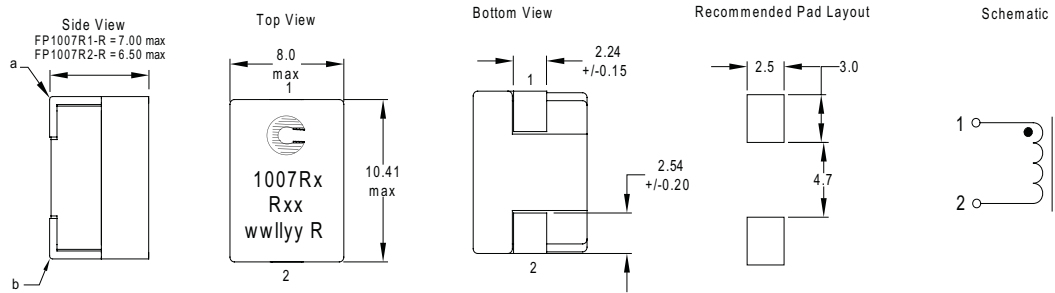
• FP1007 = Product code and size

• Rx is the DCR indicator

• Rxx= Inductance value in μH, R = decimal point

• "-R" suffix = RoHS compliant

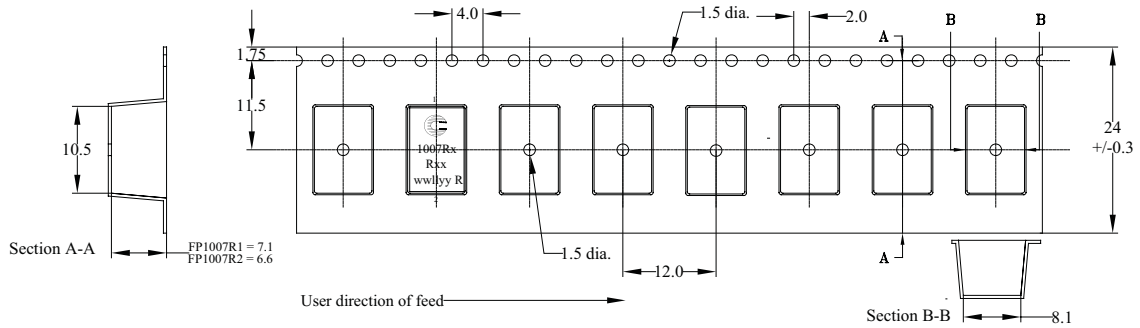
Dimensions - mm



The nominal DCR is measured from point "a" to point "b."

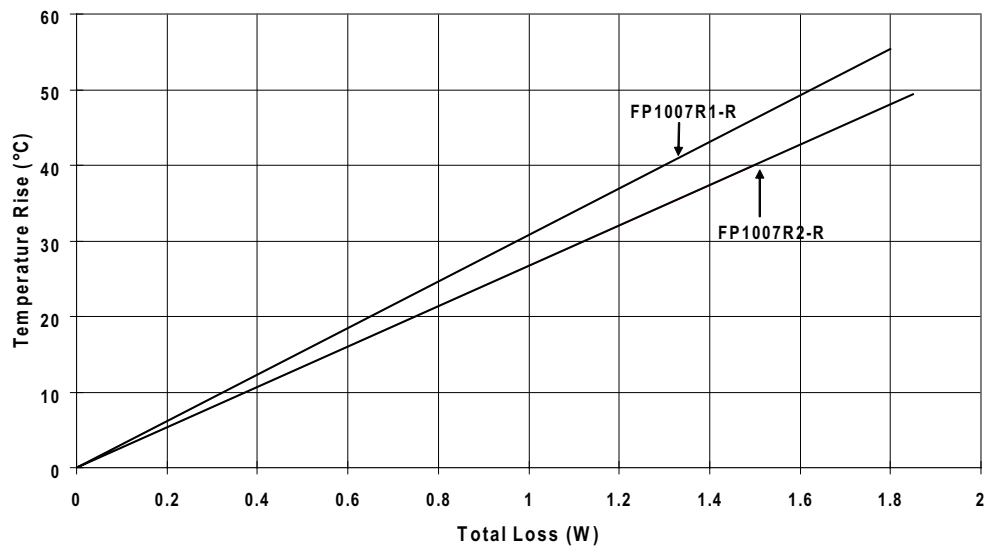
Part Marking: Coiltronics Logo 1007Rx (Rx = DCR Indicator) Rxx = Inductance value in μH . (R = Decimal point) wwllyy = Date code R = Revision level

Packaging Information - mm



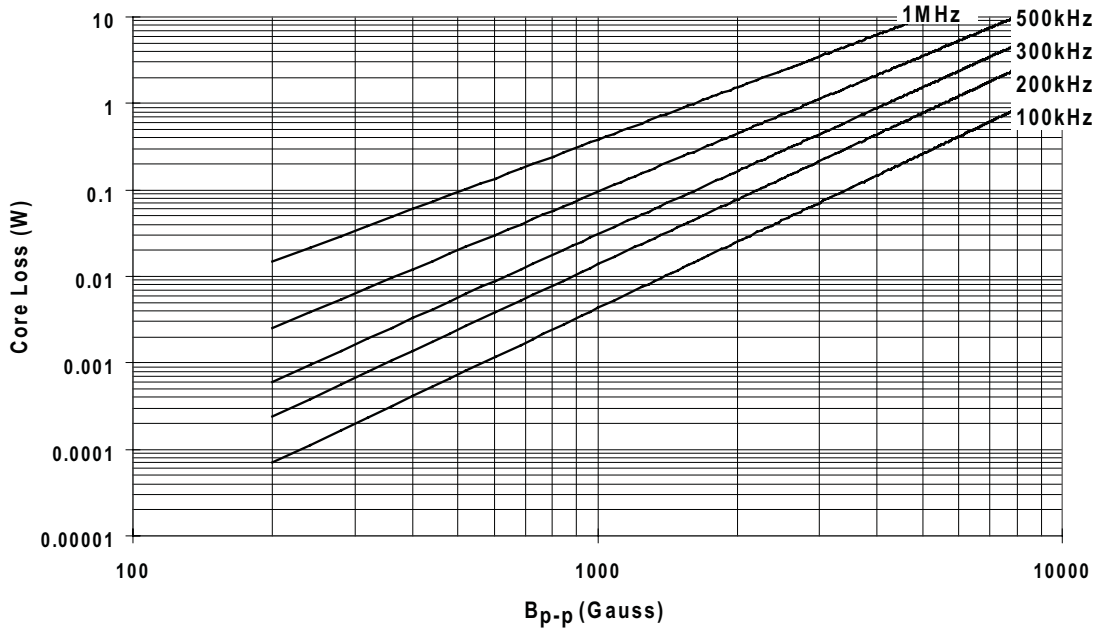
Supplied in tape-and-reel packaging, on 13" diameter reel; FP1007R1 700 parts, FP1007R2 750 parts

Temperature Rise vs. Total Loss



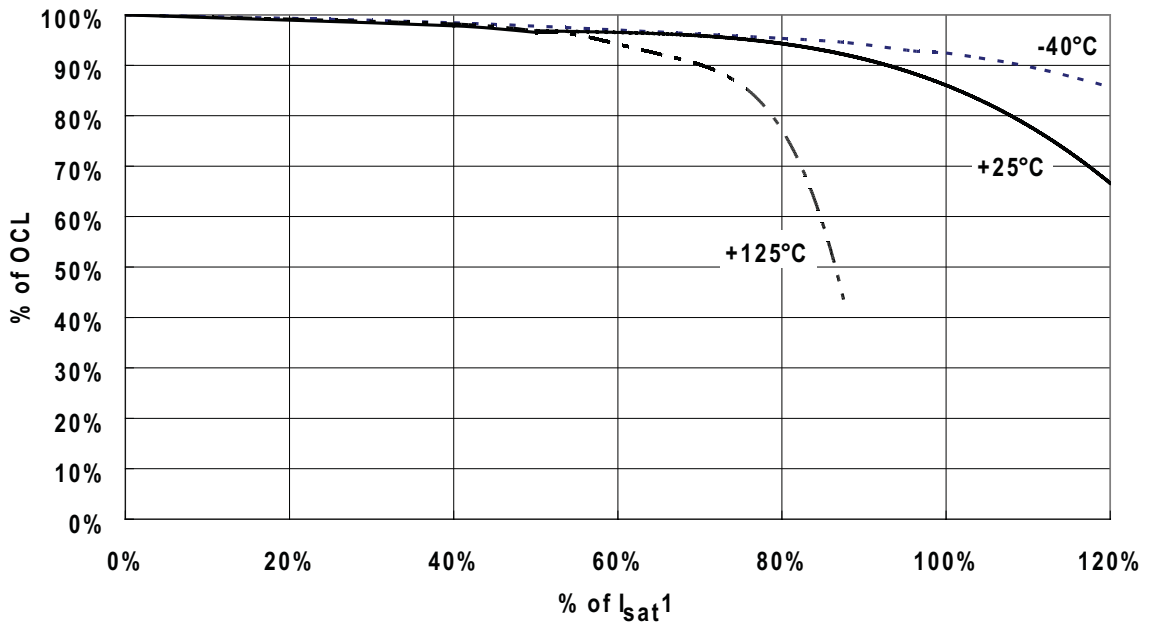
Core Loss

Core Loss vs. B_{p-p}



Inductance Characteristics

% of OCL vs. % of I_{sat1}



Solder Reflow Profile

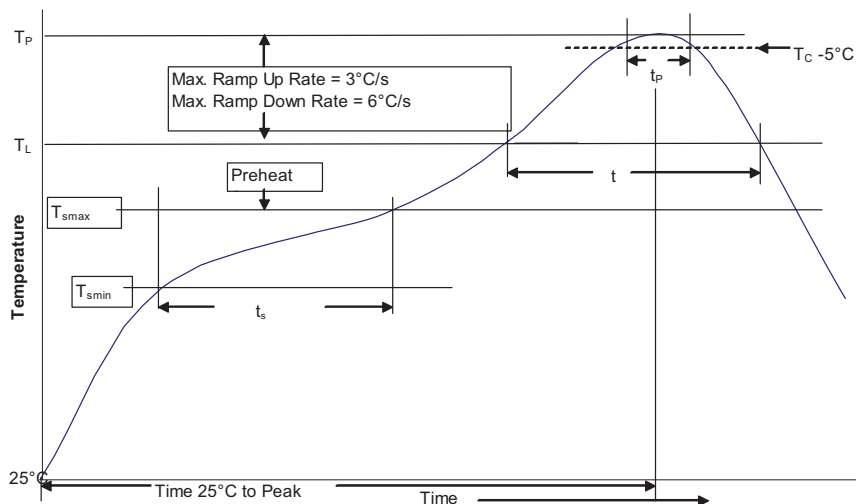


Table 1 - Standard SnPb Solder (T_c)

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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