

High Current, Low-Profile Power Inductors

FLAT-PAC™ FP1105 Series



SMD Device

Description

- 125°C maximum total temperature operation
- 11.0 x 8.0 x 4.90mm surface mount package
- Ferrite core material
- High current carrying capacity
- Low core losses
- Controlled DCR tolerance for sensing circuits
- Inductance range from 101nH to 226nH
- Current range from 39 to 81Amps
- Frequency range up to 2MHz
- RoHS compliant

Applications

- Multi-phase regulators
- Voltage Regulator Module (VRM)
- Portable electronics
- Servers and workstations
- Data networking and storage systems
- Notebook and desktop computers
- Graphics cards and battery power systems
- DCR sensing

RoHS
2002/95/EC

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, 900 parts per reel, 13" dia. reel

Product Specifications

Part Number	OCL ¹ ± 10% (nH)	FLL ² Min. (nH)	I _{rms} ³ (Amps)	I _{sat} ¹⁴ @ 25°C (Amps)	I _{sat} ²⁵ @ 125°C (Amps)	DCR (mΩ) @ 20°C	K-factor ⁶
FP1105R1-R10-R	100	72	46	81	63	0.35 ± 8.6%	467
FP1105R1-R12-R	120	86		66	50		467
FP1105R1-R15-R	150	109		54	42		467
FP1105R1-R20-R	192	138		42	34		467
FP1105R1-R22-R	226	163		39	28		467

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.

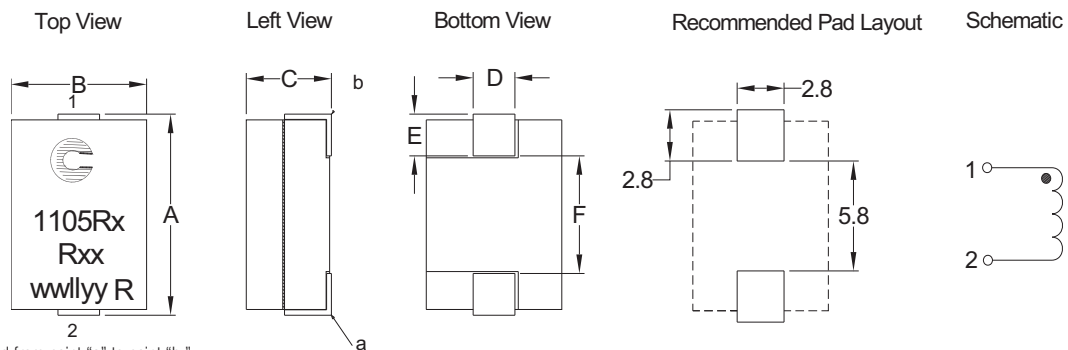
5 I_{sat}²: Peak current for approximately 20% rolloff at +125°C.

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: FP1105Rx-Rxx-R

- FP1105 = Product code and size
- Rx is the DCR indicator
- Rxx = Inductance value in μH, R = decimal point
- "-R" suffix = RoHS compliant

Dimensions - mm A = 11.0 Max. B = 8.0 Max. C = 4.9 Max. D = 2.4 ± 0.2 E = 2.3 ± 0.3 F = 6.2 Typ.



Nominal DCR is measured from point "a" to point "b."

Part Marking: Coiltronics Logo

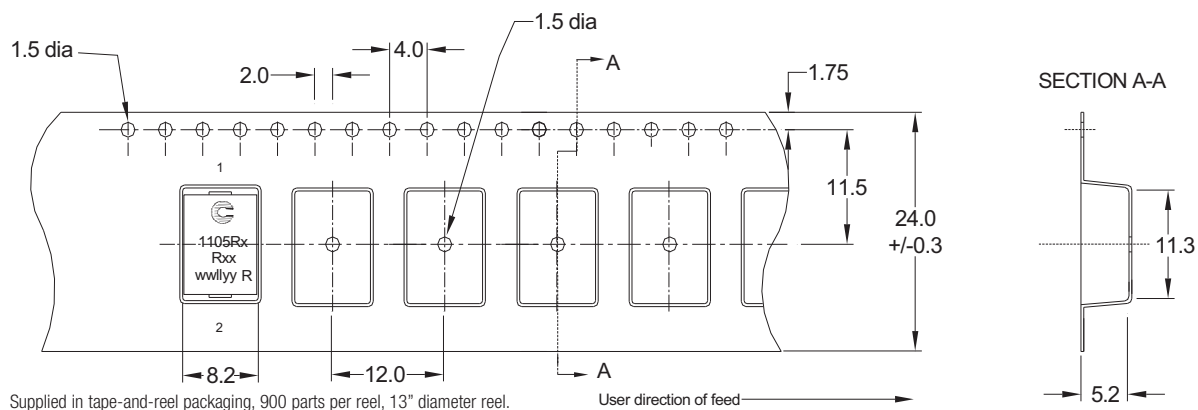
1105Rx (Rx = DCR indicator)

Rxx = inductance value in μH (R = decimal point)

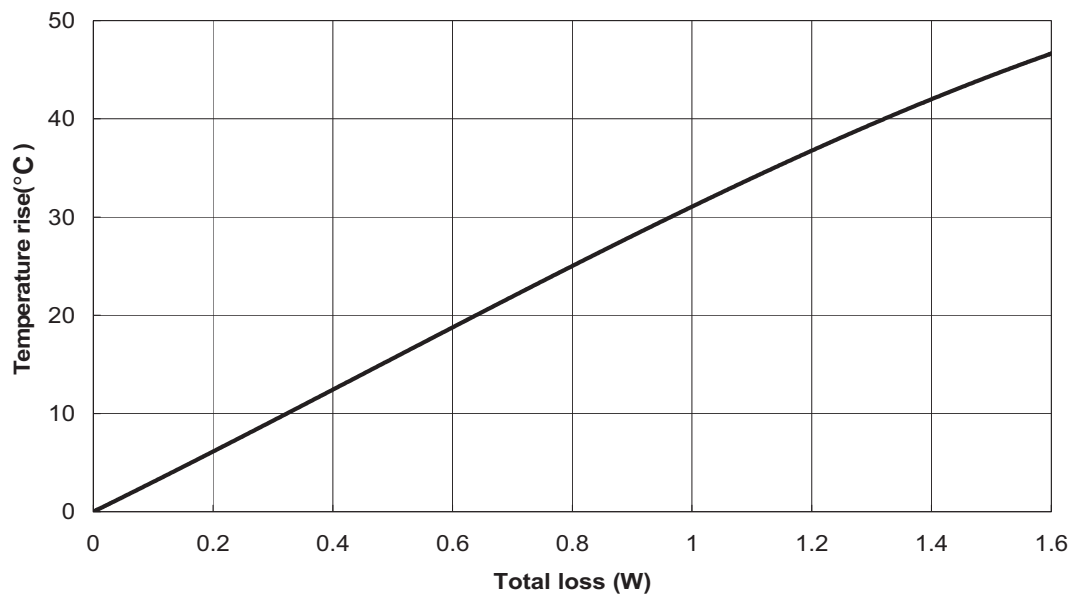
wwlllyy = date code

R = revision level

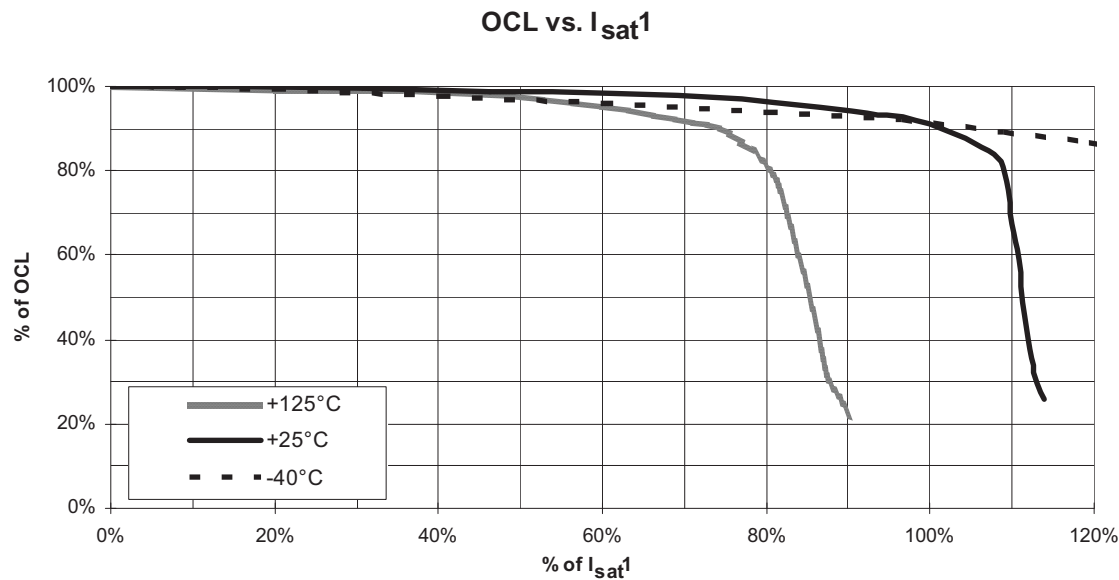
Packaging Information - mm



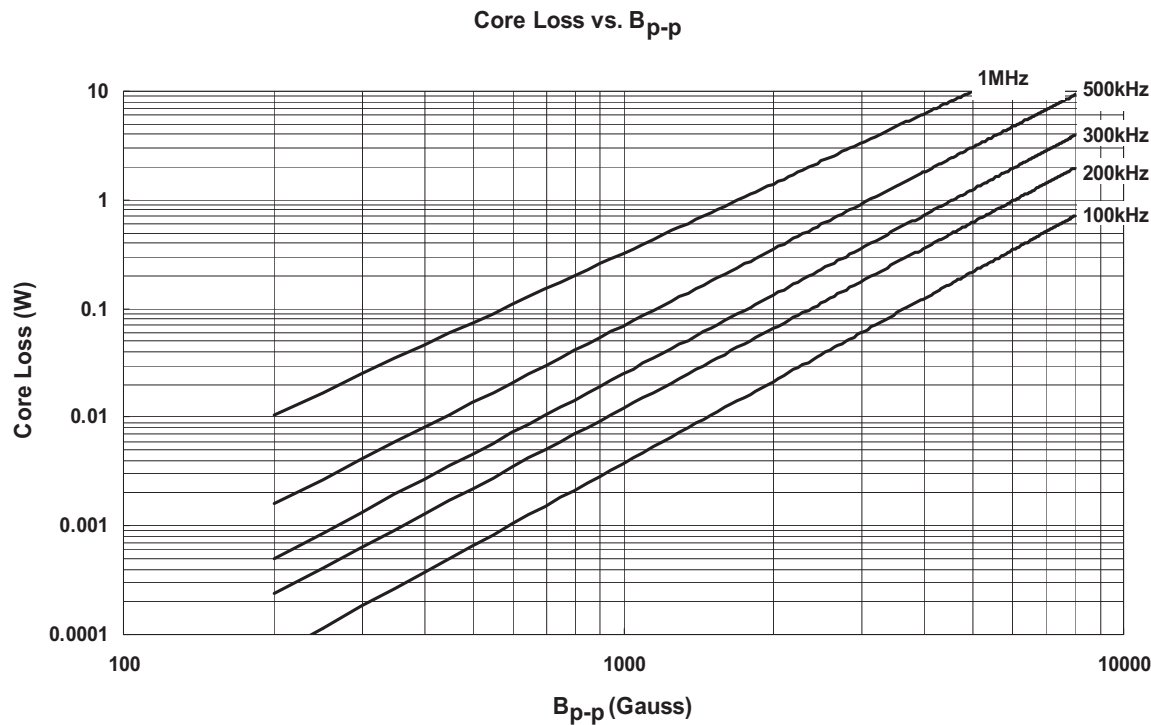
Temperature Rise vs.Total Loss



Inductance Characteristics



Core Loss



Solder Reflow Profile

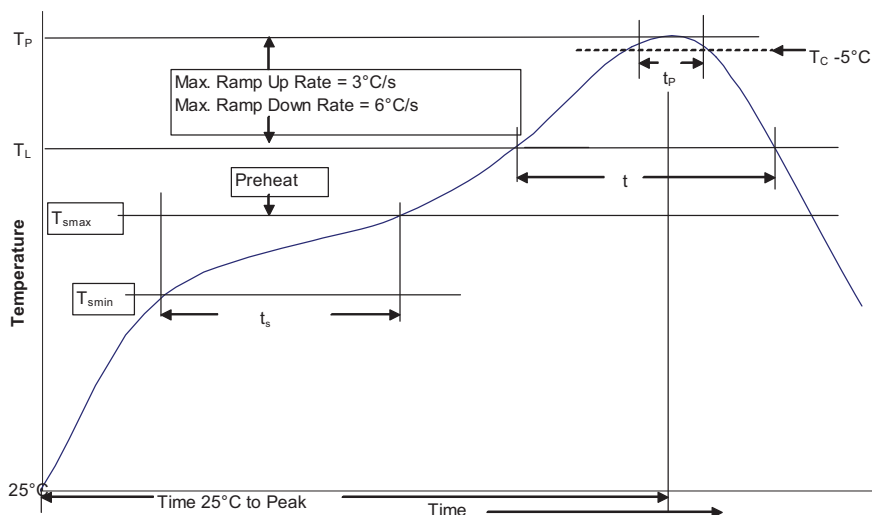


Table 1 - Standard SnPb Solder (T_c)

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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