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[FP1505R1-R10-R](#)

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# High Current, High Frequency, Power Inductors

## FLAT-PAC™ FP1505 Series



### Description

- Halogen Free
- 125°C maximum total operating temperature
- 7.0 x 15.0 x 5.0mm surface mount package
- Ferrite core material
- High current handling capability, low core loss
- Designed for high speed, high current switch mode applications
- Controlled DCR tolerance for sensing circuits
- Inductance range from 100nH to 400nH

- Current range from 24 to 105 amps
- Frequency range up to 1MHz
- RoHS compliant

### Applications

- Multi-phase regulators
- Voltage Regulator Module (VRM)
- Desktop and server VRMs and EVRDs
- Data networking and storage systems
- Notebook regulators
- Graphics cards and battery power systems
- Point of load modules
- DCR current sensing



### Environmental Data

- Storage temperature range: -40°C to +125°C
- Operating temperature range: -40°C to +125°C (with derated current)
- Solder reflow temperature: J-STD-020D compliant

### Packaging

- Supplied in tape-and-reel packaging, 744 parts per reel, 13" diameter reel

### Product Specifications

Part Number <sup>7</sup>	OCL <sup>1</sup> ± 10% (nH)	FLL <sup>2</sup> Min. (nH)	I <sub>rms</sub> <sup>3</sup> (Amps)	I <sub>sat</sub> 1 <sup>4</sup> (Amps) @25°C	I <sub>sat</sub> 2 <sup>5</sup> (Amps) @125°C	DCR (mΩ) @20°C	K-factor <sup>6</sup>
FP1505R1-R10-R	100	72	53	105	90	0.47 ± 7%	356.3
FP1505R1-R12-R	120	86		87	75		356.3
FP1505R1-R15-R	150	108		72	60		356.3
FP1505R1-R25-R	250	180		42	32		356.3
FP1505R1-R30-R	300	217		35	26		356.3
FP1505R1-R40-R	400	288		24	19.5		356.3

1 OCL<sup>1</sup>: Open Circuit Inductance (OCL) Test Parameters: 100kHz, 1.0V<sub>rms</sub>, 0.0Adc

2 FLL<sup>2</sup>: Full Load Inductance (FLL) Test Parameters: 100kHz, 1.0V<sub>rms</sub>, I<sub>sat</sub>1

3 I<sub>rms</sub><sup>3</sup>: 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<sub>sat</sub>1<sup>4</sup>: Peak current for approximately 20% rolloff at +25°C.

5 I<sub>sat</sub>2<sup>5</sup>: Peak current for approximately 20% rolloff at +125°C.

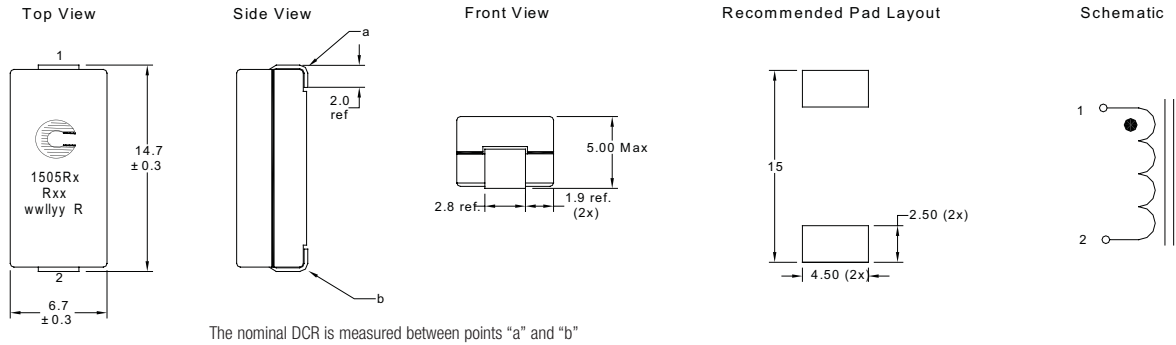
6 K-factor: Used to determine B<sub>p-p</sub> for core loss (see graph). B<sub>p-p</sub> = K \* L \* ΔI \* 10<sup>-3</sup>. B<sub>p-p</sub>:(Gauss), K: (K-factor from table), L: (Inductance in nH), ΔI (Peak-to-peak ripple current in amps).

7 Part Number Definition: FP1505Rx-Rxx-R

- FP1505 = Product code and size
- Rx= DCR indicator
- Rxx= Inductance value in uH, R = decimal point
- -R suffix = RoHS compliant

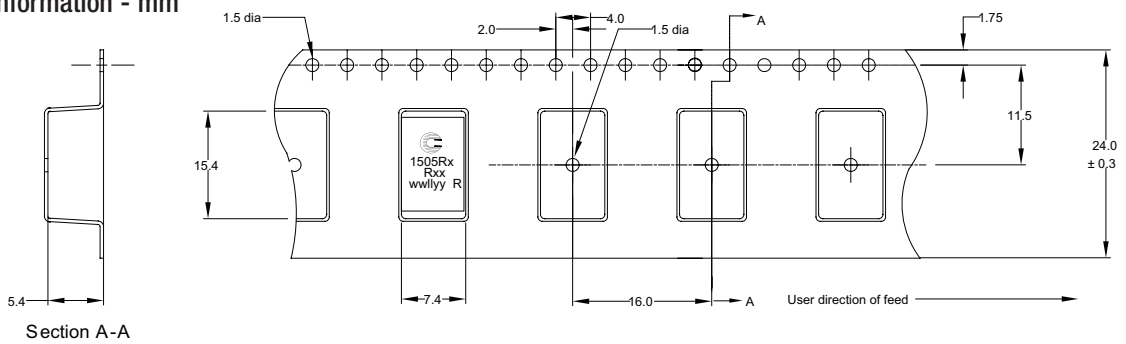


**Dimensions - mm**



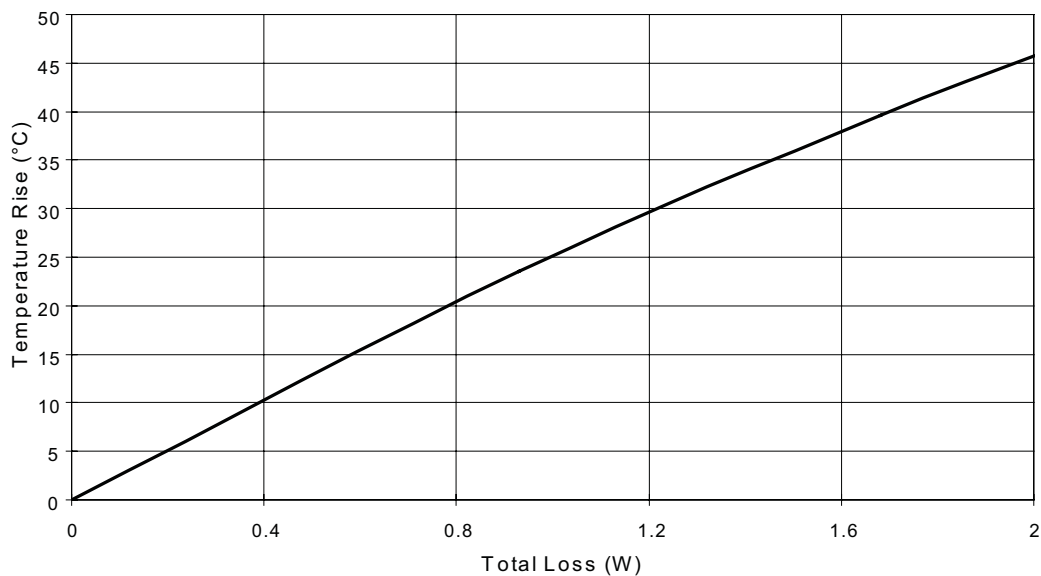
Part Marking: Coiltronics logo    1505Rx    Rx = DCR indicator    Rxx = Inductance value in  $\mu$ H. (R = Decimal point).    wwlyyy = Date code    R = Revision level

**Packaging Information - mm**



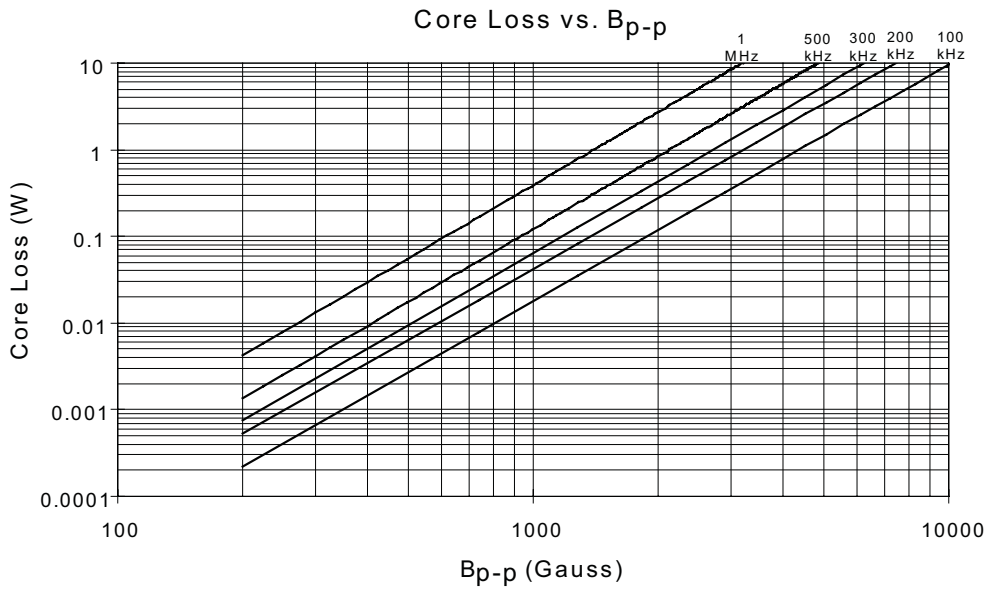
Supplied in tape-and-reel packaging, 744 parts per reel, 13" diameter reel.

**Temperature Rise vs.Total Loss**

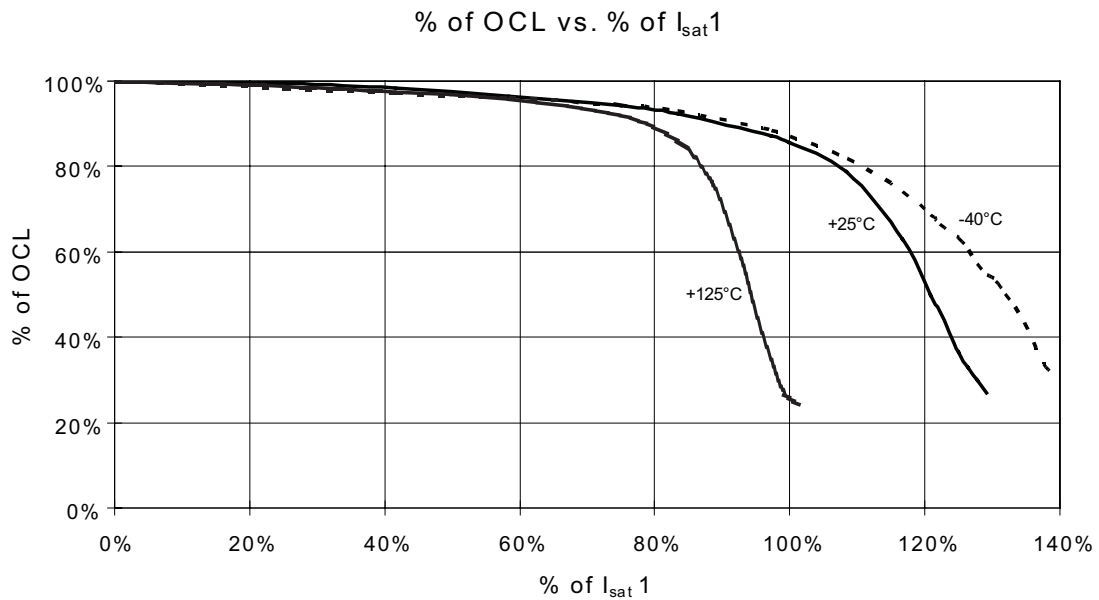




Core Loss



Inductance Characteristics





### Solder Reflow Profile

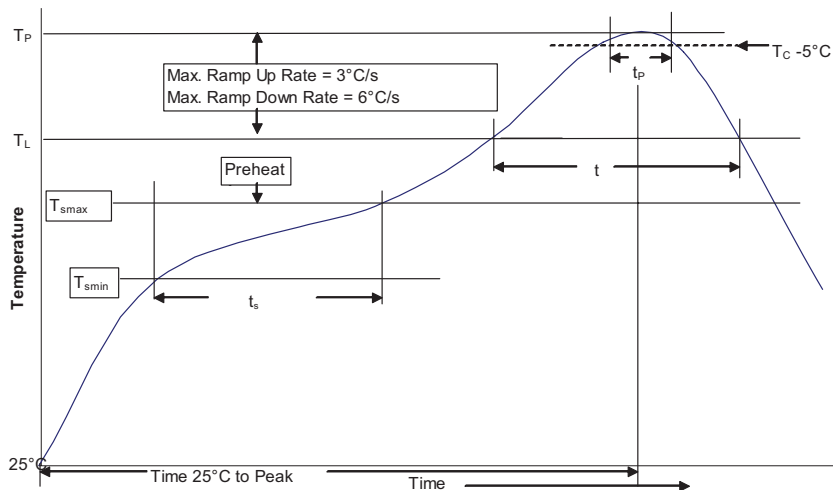


Table 1 - Standard SnPb Solder (T<sub>c</sub>)

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5mm	235°C	220°C
≥2.5mm	220°C	220°C

Table 2 - Lead (Pb) Free Solder (T<sub>c</sub>)

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350 - 2000	Volume mm <sup>3</sup> >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 <sub>smin</sub> )	100°C	150°C
• Temperature max. (T <sub>smax</sub> )	150°C	200°C
• Time (T <sub>smin</sub> to T <sub>smax</sub> ) (t <sub>s</sub> )	60-120 Seconds	60-120 Seconds
Average ramp up rate T <sub>smax</sub> to T <sub>p</sub>	3°C/ Second Max.	3°C/ Second Max.
Liquidous temperature (T <sub>L</sub> )	183°C	217°C
Time at liquidous (t <sub>L</sub> )	60-150 Seconds	60-150 Seconds
Peak package body temperature (T <sub>p</sub> )*	Table 1	Table 2
Time (t <sub>p</sub> )** within 5 °C of the specified classification temperature (T <sub>c</sub> )	20 Seconds**	30 Seconds**
Average ramp-down rate (T <sub>p</sub> to T <sub>smax</sub> )	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<sub>p</sub>) is defined as a supplier minimum and a user maximum.

\*\* Tolerance for time at peak profile temperature (t<sub>p</sub>) is defined as a supplier minimum and a user maximum.

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