

# High Current, High Frequency, Power Inductors

## Flat-Pac™ FP1007R6 Series



### Description

- Halogen free, lead free, RoHS compliant
- 125°C Maximum total temperature operation
- 10.5 x 8.0 x 7.0mm Maximum surface mount package
- Ferrite core material
- Controlled DCR tolerance for sensing circuits
- Inductance Range from 150nH to 470nH
- Current range from 23.5 to 75 Amps
- Frequency range up to 2MHz

### 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

### Environmental Data

- Storage temperature range: -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

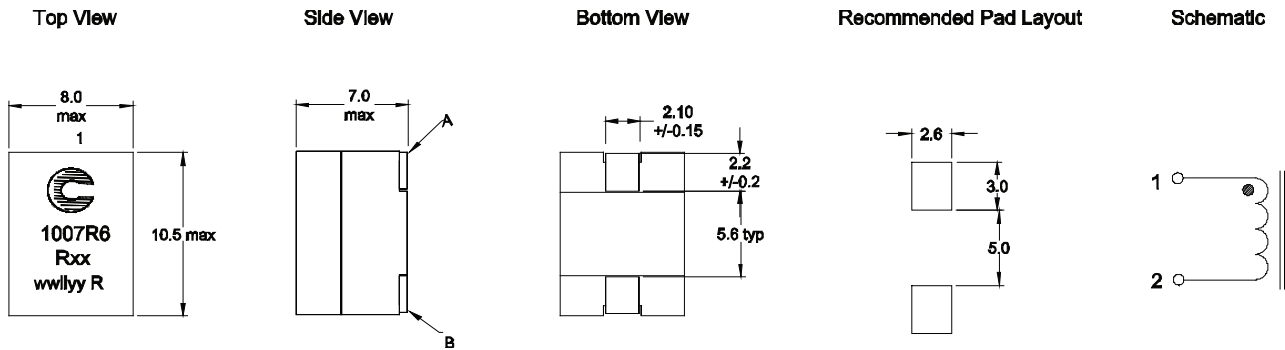
- Supplied in tape-and-reel packaging, 700 parts per 13 inch diameter reel

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> <sup>14</sup> @25°C (Amps)	I <sub>sat</sub> <sup>25</sup> @100°C (Amps)	DCR @20°C (mΩ)	K-Factor <sup>6</sup>
FP1007R6-R15-R	150	108	61	75.0	60.0	0.29 ± 5%	348.8
FP1007R6-R18-R	180	129		60.0	50.0		
FP1007R6-R22-R	220	158		50.0	40.0		
FP1007R6-R27-R	270	194		41.0	33.0		
FP1007R6-R33-R	330	237		33.0	26.5		
FP1007R6-R39-R	390	280		28.0	22.5		
FP1007R6-R47-R	470	338		23.5	19.0		

1. Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.10V<sub>rms</sub>, 0.0Acd  
 2. Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1V<sub>rms</sub>, I<sub>sat</sub><sup>1</sup>  
 3. I<sub>rms</sub>: 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><sup>1</sup>: Peak current for approximately 20% rolloff at +25°C.

5. I<sub>sat</sub><sup>2</sup>: Peak current for approximately 20% rolloff at +100°C.  
 6. K-factor: Used to determine B<sub>p-p</sub> for core loss (see graph).  
 $B_{p-p} = K * L * \Delta I * 10^{-3}$ . 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: FP1007R6-Rxx-R  
 FP1007R6 = Product code and size  
 Rxx= Inductance value in uH, R = decimal point  
 -R suffix = RoHS compliant

## Dimensions - mm



The nominal DCR is measured from point "A" to point "B"

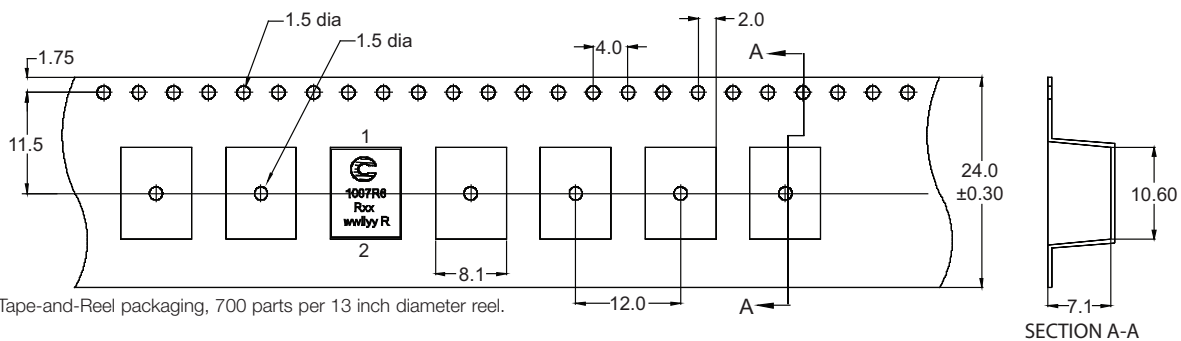
Part Marking: Coiltronics Logo, 1007R6, Rxx = Inductance value in  $\mu\text{H}$ . (R = Decimal point) wvlyy = Date code R = Revision level

Tolerance are  $\pm 0.15\text{mm}$  unless otherwise specified.

Soldering surfaces to be coplanar within 0.1016mm.

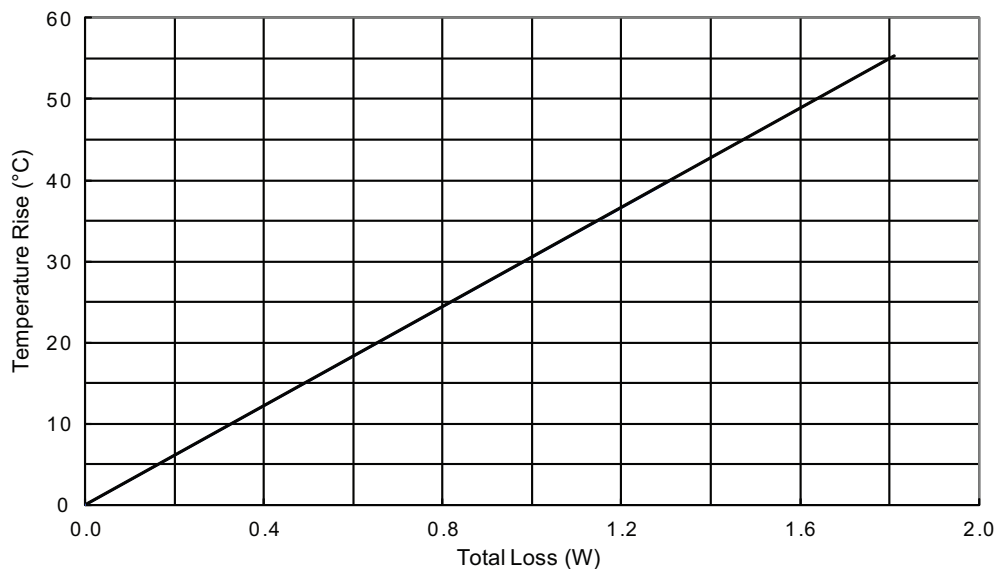
PCB tolerance  $\pm 0.1\text{mm}$  unless otherwise specified.

## Packaging Information - mm

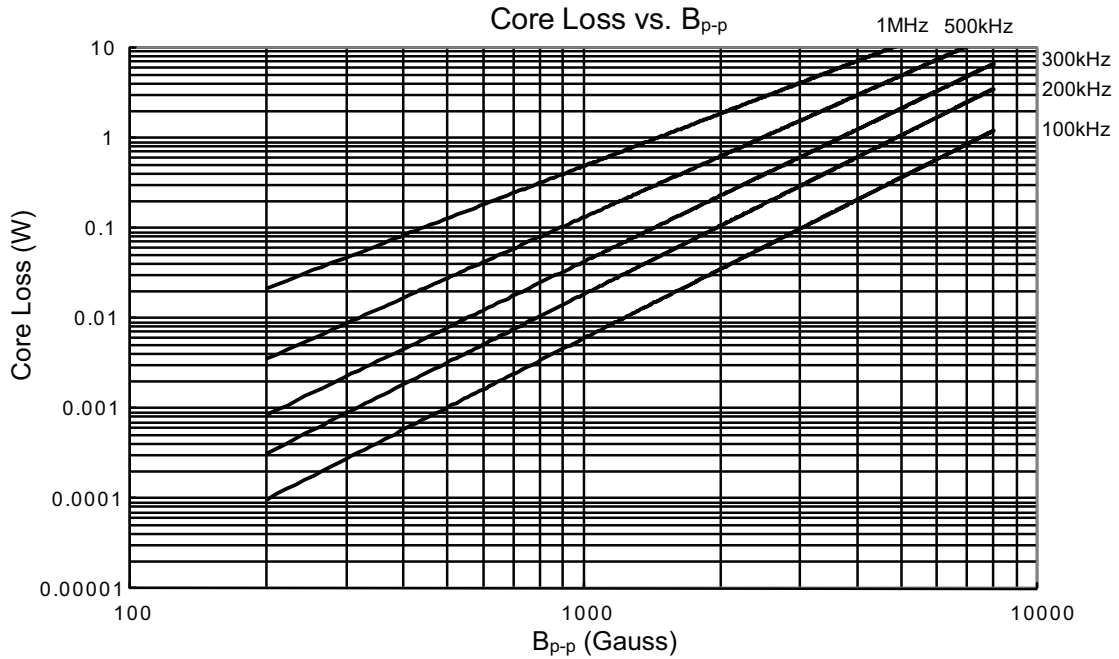


Supplied in Tape-and-Reel packaging, 700 parts per 13 inch diameter reel.

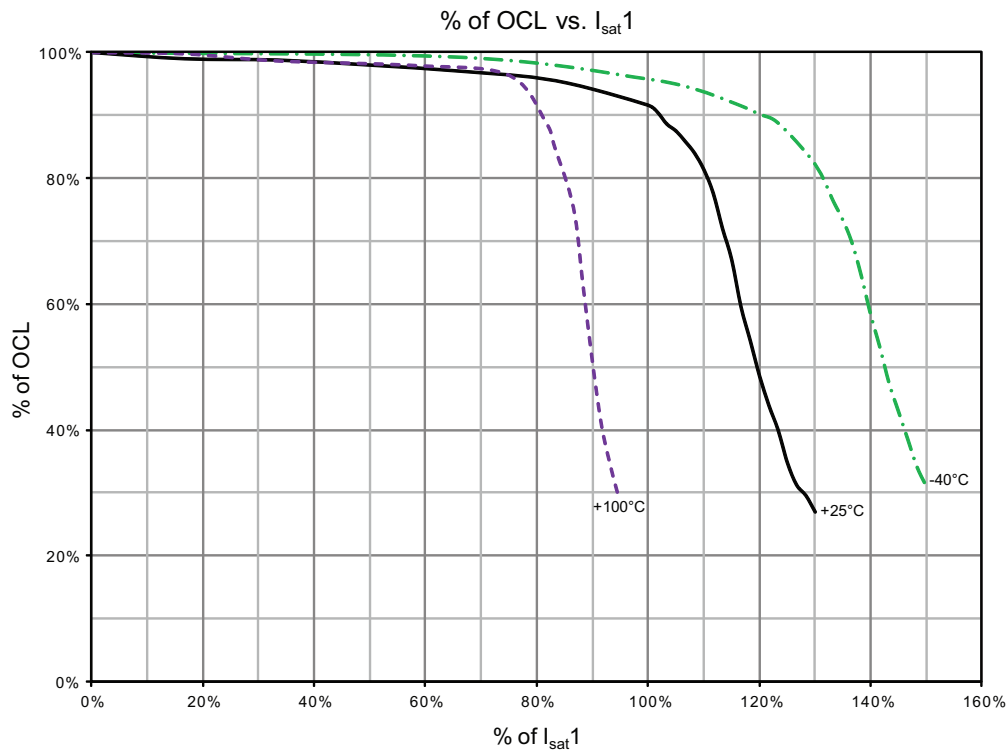
## Temperature Rise vs. Total Loss



## Core Loss



## Inductance Characteristics



## Solder Reflow Profile

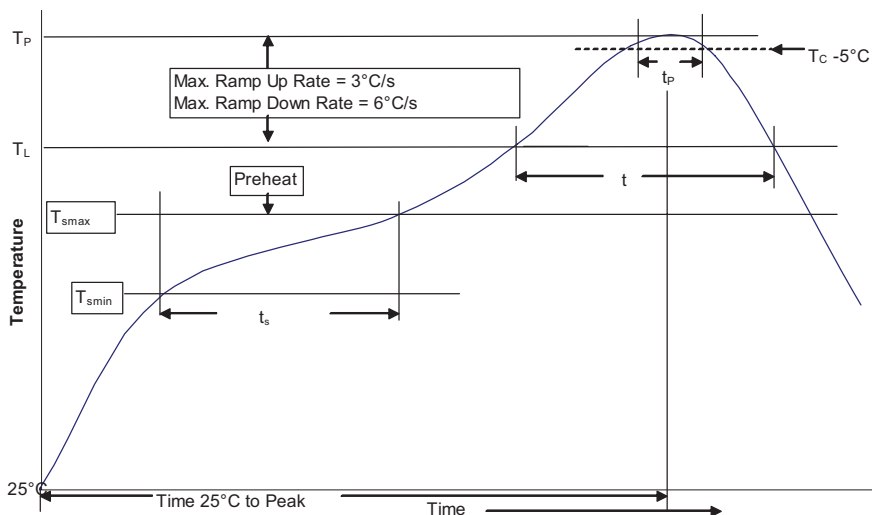


Table 1 - Standard SnPb Solder ( $T_c$ )

Package Thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ $\geq 350$
<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 $\text{mm}^3$ <350	Volume $\text{mm}^3$ 350 - 2000	Volume $\text{mm}^3$ >2000
<1.6mm	260°C	260°C	260°C
1.6 – 2.5mm	260°C	250°C	245°C
$>2.5\text{mm}$	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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