

# FP0807

## High frequency, high current power inductors



### Applications

- Multi-phase and Vcore regulators
- Voltage Regulator Module (VRM)
- Desktop and server VRMs and EVRDS
- Data networking and storage systems
- Graphics cards and battery power systems
- Point-of-load modules

### Environmental Data

- Storage temperature range: -40°C to +125°C
- Operating temperature range: -40°C to +125°C (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020D compliant



### Product description

- High current carrying capacity
- Low core losses
- Inductance range from 70nH to 220nH
- Current range from 35 to 108 amps
- Frequency range up to 2MHz
- 7.4 x 7.6 footprint surface mount package in a 7.0mm height
- Ferrite core material
- Halogen free, lead free, RoHS compliant

## Product Specifications

Part Number <sup>7</sup>	OCL <sup>1</sup> (nH) $\pm 10\%$	FLL <sup>2</sup> (nH) min	Irms <sup>3</sup> (amps)	Isat1 <sup>4</sup> (amps)	Isat2 <sup>5</sup> (amps)	DCR (mΩ) $\pm 6\% @ 20^\circ\text{C}$	K-factor <sup>6</sup>
R1 version							
FP0807R1-R07-R	70	50	45	108	79	0.50	520
FP0807R1-R10-R	100	72	45	77	55	0.50	520
FP0807R1-R12-R	120	86	45	66	48	0.50	520
FP0807R1-R16-R	160	115	45	48	36	0.50	520
FP0807R1-R18-R	180	129	45	42	32	0.50	520
FP0807R1-R20-R	200	144	45	38	28	0.50	520
FP0807R1-R22-R	220	158	45	35	25	0.50	520

1. Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.10Vrms, 0.0Adc @25°C

2. Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1Vrms, Isat1 @25°C

3. Irms: 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. Isat1: Peak current for approximately 20% rolloff at +25°C.

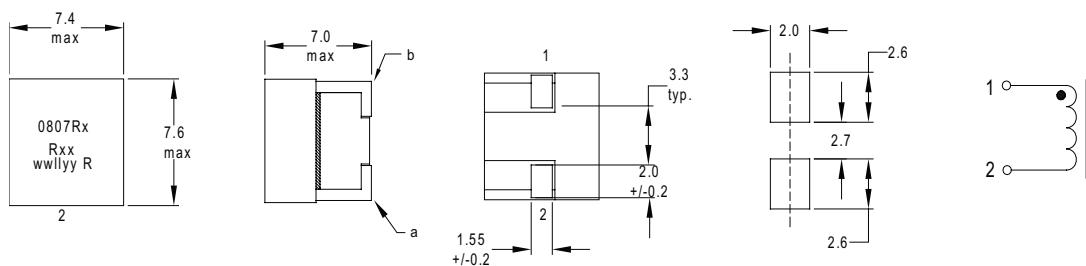
5. Isat2: Peak current for approximately 20% rolloff at +125°C.

6. K-factor: Used to determine Bp-p for core loss (see graph). Bp-p = K \* L \*  $\Delta I * 10^3$ , Bp-p : (Gauss), K: (K-factor from table), L: (inductance in nH),  $\Delta I$  (peak-to-peak ripple current in amps).

7. Part Number Definition: FP0807Rx-Rxx-R

- FP0807R = Product code and size
- x is the version indicator
- -Rxx= Inductance value in  $\mu\text{H}$ , R = decimal point
- “-R” suffix = RoHS compliant

## Dimensions (mm)



Part marking: 0807Rx (x= version indicator )

Rxx (xx=inductance value in  $\mu\text{H}$ , R= decimal point)

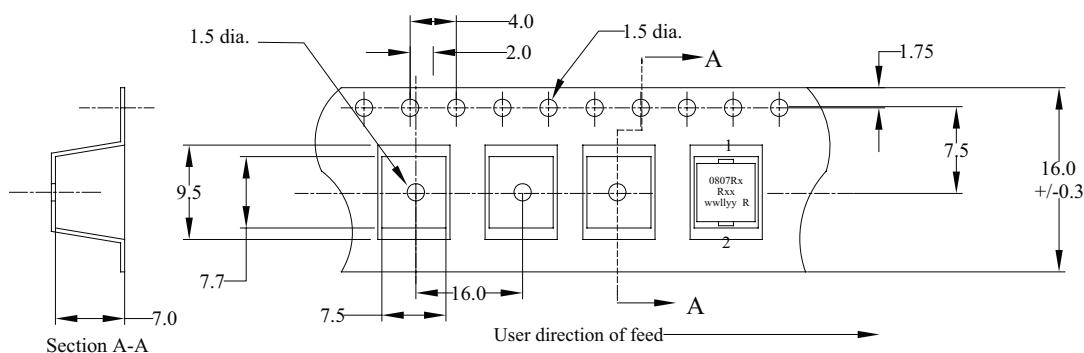
wwllyy = date code, R = revision level

DCR measured from point “a” to point “b”

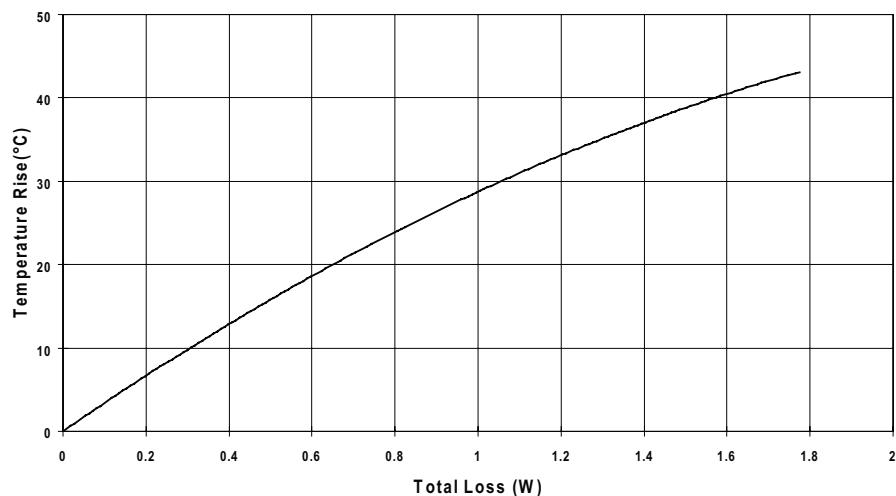
Do not route traces or vias underneath the inductor

## Packaging information (mm)

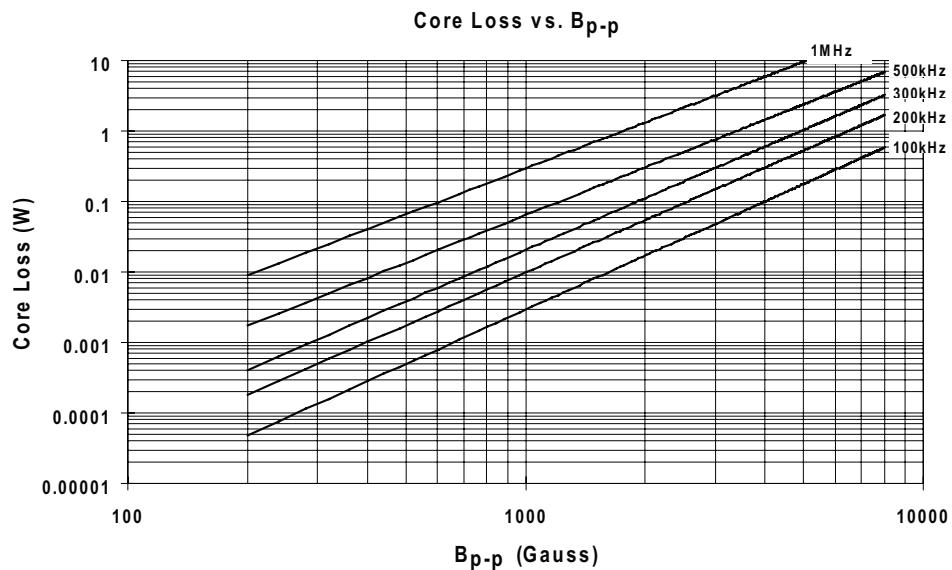
Supplied in tape-and-reel packaging, 600 parts per reel, 13" diameter reel.



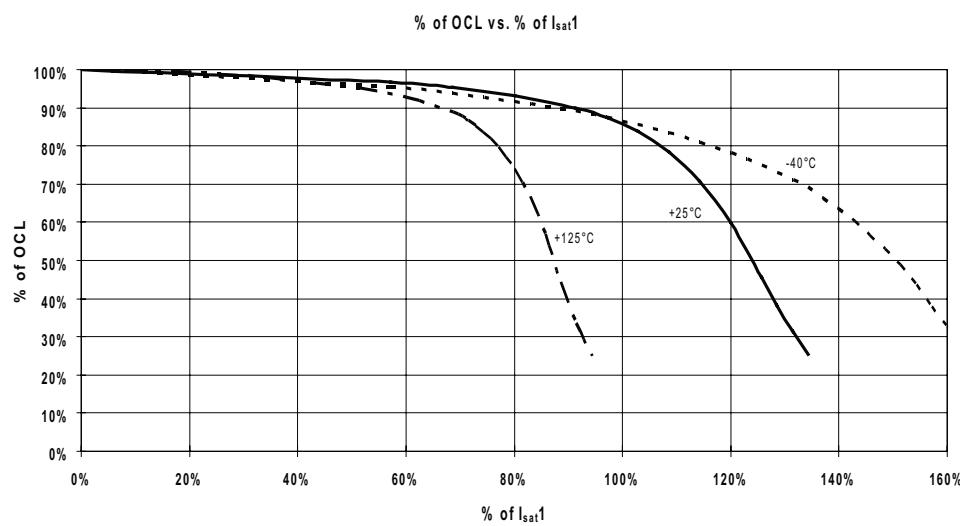
Temperature rise vs. total loss



Core loss



Inductance characteristics



### Solder reflow profile

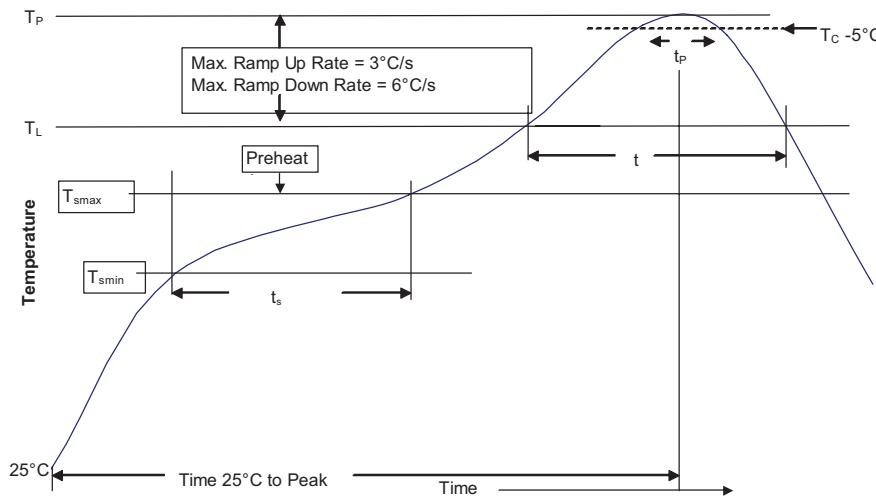


Table 1 - Standard SnPb Solder ( $T_c$ )

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 ( $T_c$ )

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	<ul style="list-style-type: none"> <li>Temperature min. (<math>T_{smin}</math>)</li> <li>Temperature max. (<math>T_{smax}</math>)</li> <li>Time (<math>T_{smin}</math> to <math>T_{smax}</math>) (<math>t_s</math>)</li> </ul>	100°C 150°C 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.

Life Support Policy: Eaton does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

Eaton reserves the right, without notice, to change design or construction of any products and to discontinue or limit distribution of any products. Eaton also reserves the right to change or update, without notice, any technical information contained in this bulletin.

**Eaton**  
Electronics Division  
1000 Eaton Boulevard  
Cleveland, OH 44122  
United States  
[www.eaton.com/elx](http://www.eaton.com/elx)

© 2015 Eaton  
All Rights Reserved  
Printed in USA  
Publication No. 4343 BU-SB08620  
December 2015

Eaton is a registered trademark.

All other trademarks are property  
of their respective owners.