



**THE DATASHEET OF  
FP0807R1-R12-R**



# FP0807

## High frequency, high current power inductors



### 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

### 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



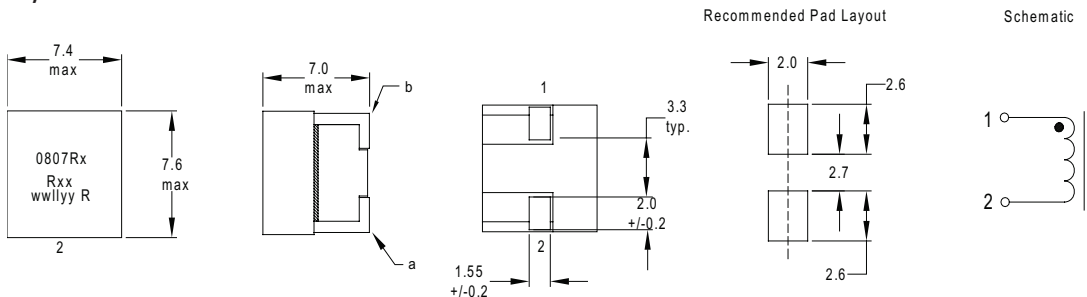
**Product Specifications**

Part Number <sup>7</sup>	OCL <sup>1</sup> (nH) ±10%	FLL <sup>2</sup> (nH) min	I <sub>rms</sub> <sup>3</sup> (amps)	Isat1 <sup>4</sup> (amps)	I sat2 <sup>5</sup> (amps)	DCR (mΩ) ±6% @ 20°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. I<sub>rms</sub>: 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), ΔI (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 μH, R = decimal point
  - "-R" suffix = RoHS compliant

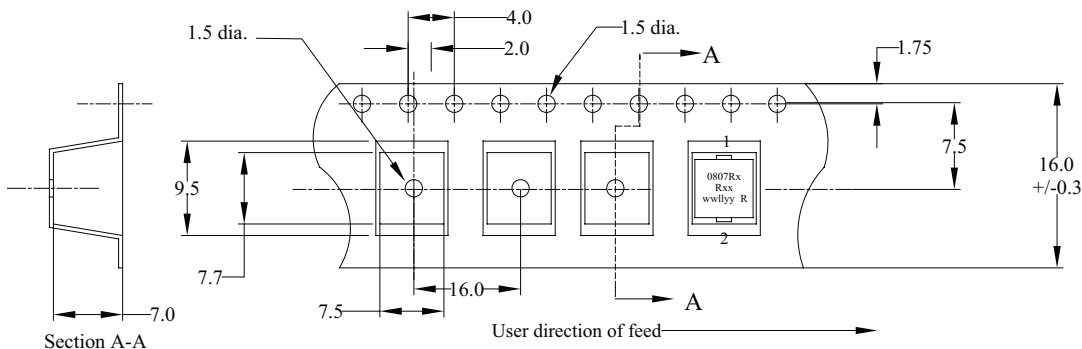
**Dimensions (mm)**



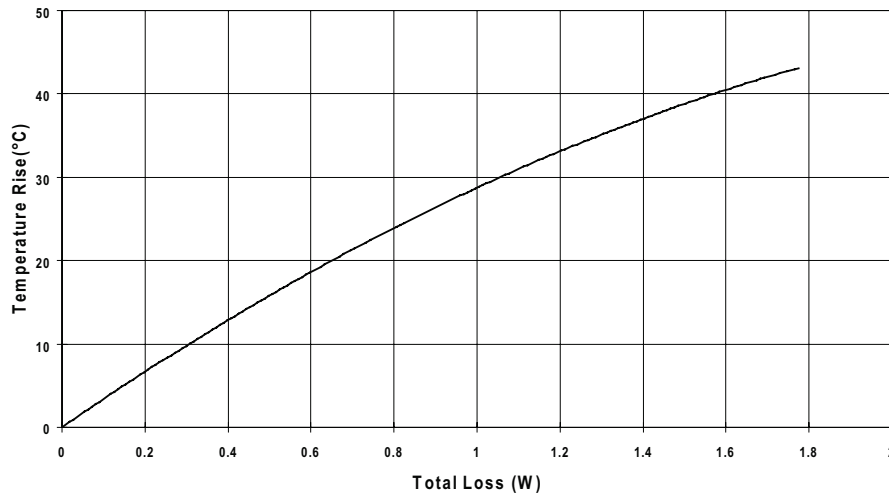
Part marking: 0807Rx (x= version indicator )  
 Rxx (xx=inductance value in uH, R= decimal point)  
 wwlllyy = date code, R = revision level  
 DCR measured from point "a" to point "b"  
 Do not route traces or vias underneath the inductor

**Packaging information (mm)**

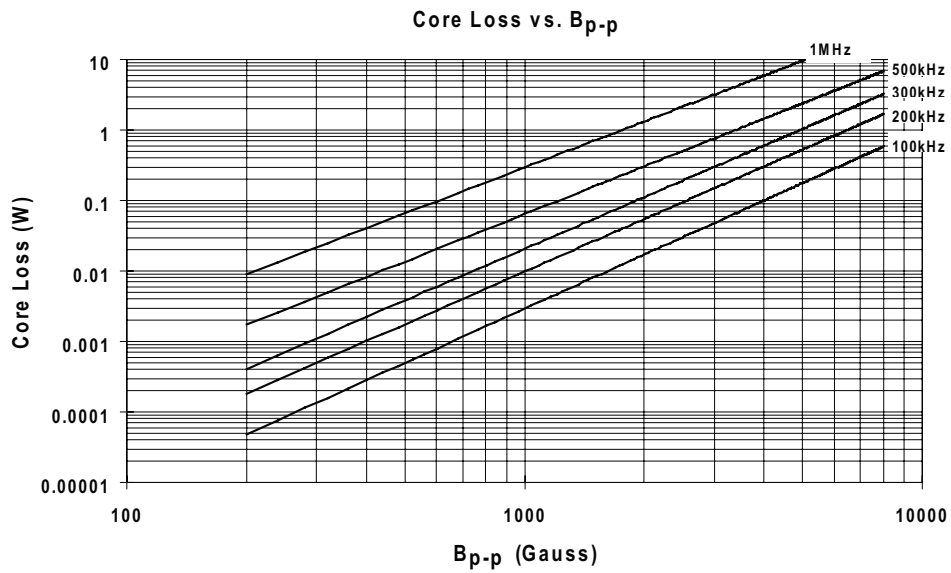
Supplied in tape-and-reel packaging, 600 parts per reel, 13" diameter reel.



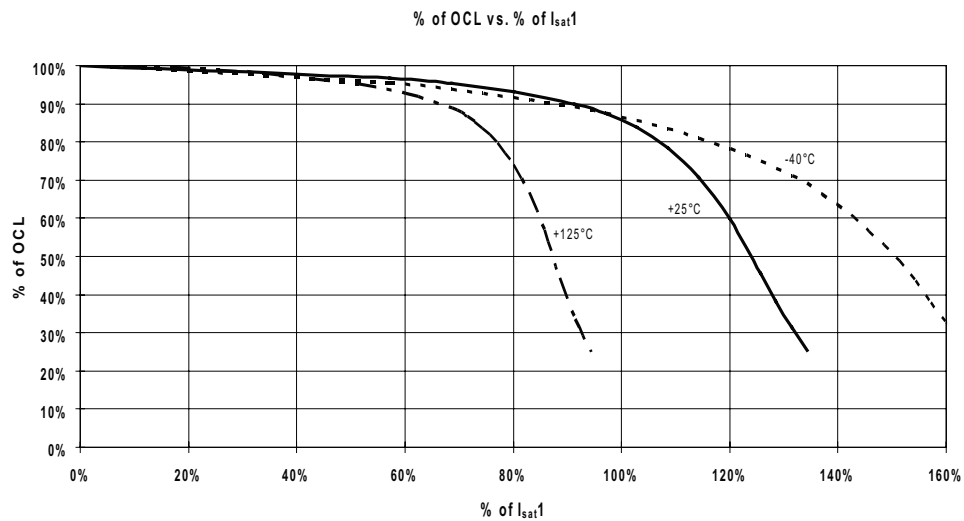
Temperature rise vs. total loss



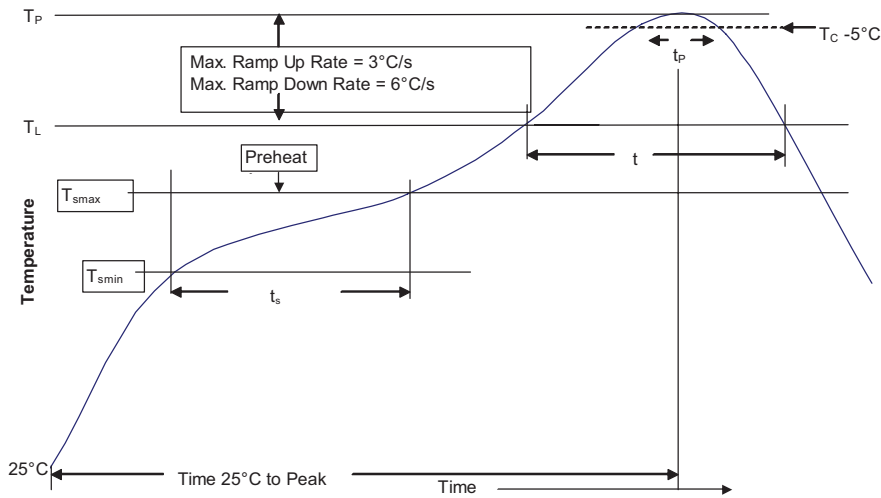
Core loss



Inductance characteristics



**Solder reflow profile**



**Table 1 - Standard SnPb Solder (T<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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