

# 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)	I <sub>sat1</sub> <sup>4</sup> (amps)	I <sub>sat2</sub> <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, I<sub>sat1</sub> @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. I<sub>sat1</sub>: Peak current for approximately 20% rolloff at +25°C.

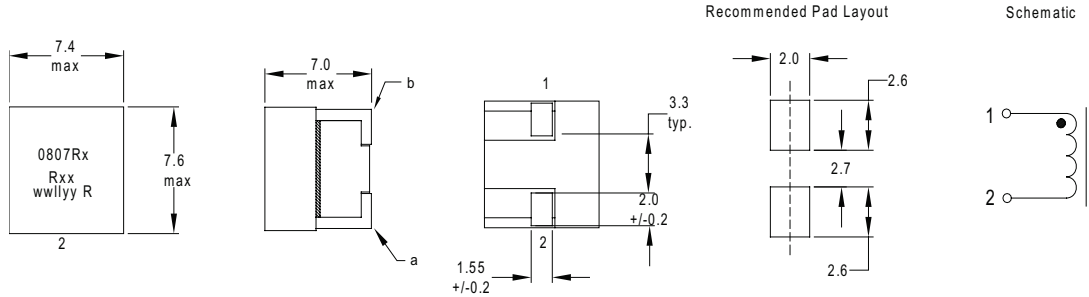
5. I<sub>sat2</sub>: Peak current for approximately 20% rolloff at +125°C.

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  $\mu H$ , R = decimal point
- "-R" suffix = RoHS compliant

## Dimensions (mm)



Part marking: 0807Rx (x= version indicator )

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

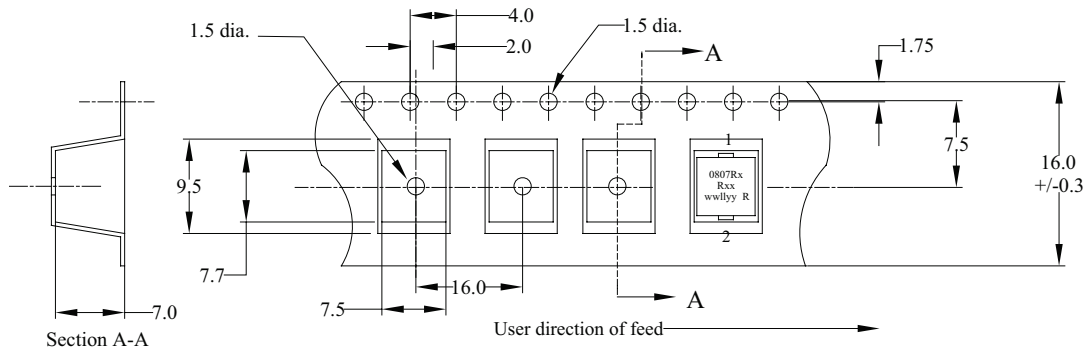
wwllly = date code, R = revision level

DCR measured from point "a" to point "b"

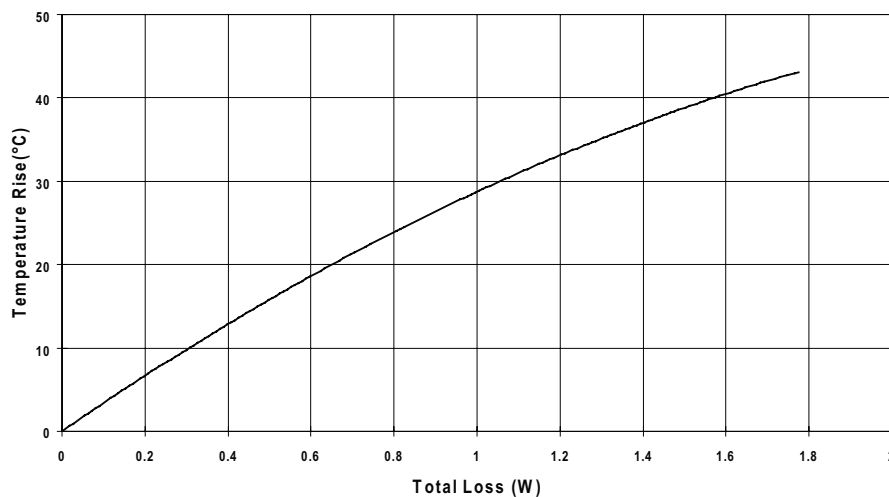
Do not route traces or vias underneath the inductor

## Packaging information (mm)

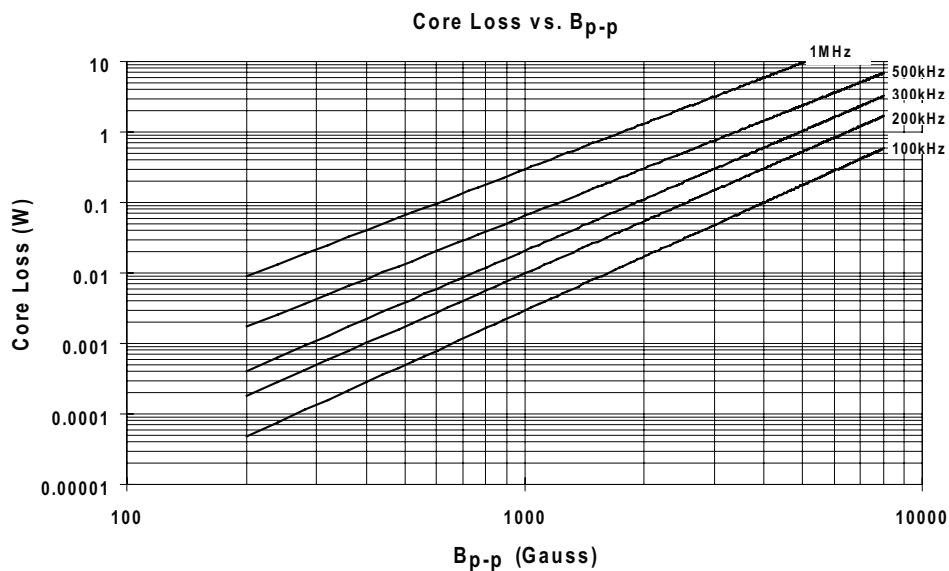
Supplied in tape-and-reel packaging, 600 parts per reel, 13" diameter reel.



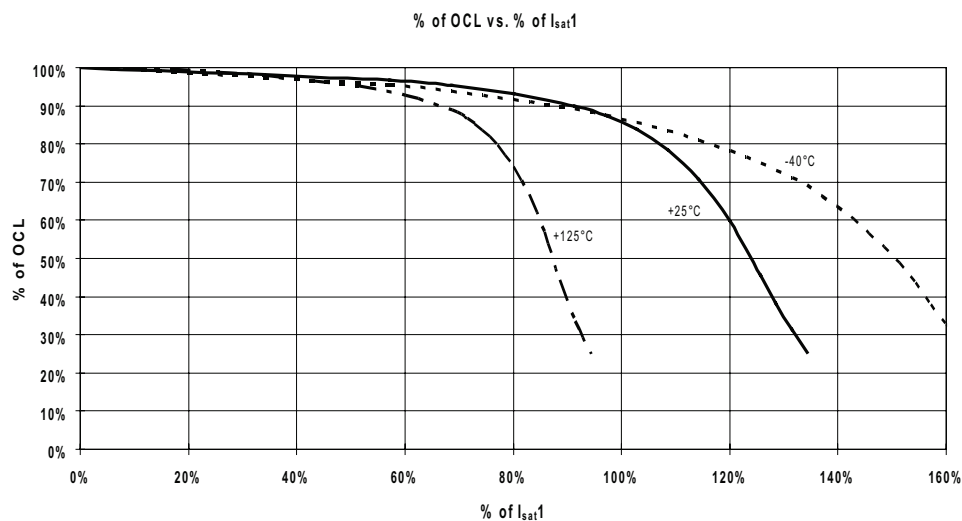
### Temperature rise vs. total loss



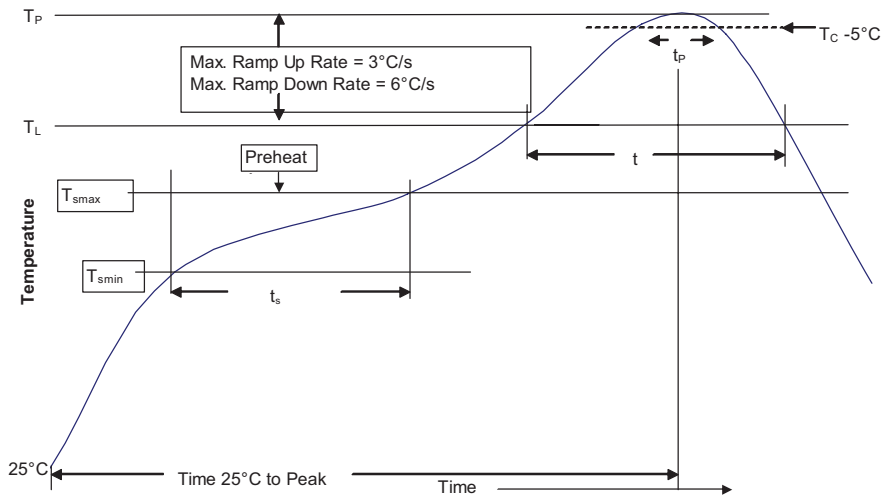
### Core loss



### 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 JEDEC 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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