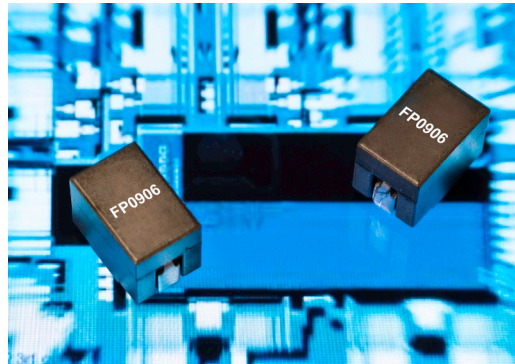


# FP0906

## High frequency, high current power inductors



### Product Description

- High current carrying capacity
- Low core loss
- Controlled DCR for sensing circuits
- Frequency range up to 2MHz
- Inductance Range from 100nH to 300nH
- Current range from 32.5 to 94 amps
- 9.6x6.45mm footprint surface mount package in a 8.0mm height
- Ferrite core material
- Halogen free, lead free, RoHS compliant

### Applications

- Multi-phase and Vcore regulators
- Voltage Regulator Modules (VRMs)
- Desktop and server VRMs and EVRDs
- Data networking and storage systems
- Graphics cards and battery power systems
- Point-of-Load modules
- DCR Sensing circuits

### Environmental Data

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



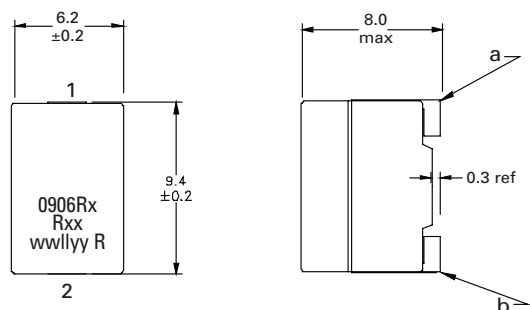
**Product specifications**

Part Number <sup>7</sup>	OCL <sup>1</sup> (nH) ±10%	FLL <sup>2</sup> (nH) minimum	I <sub>rms</sub> <sup>3</sup> (amps)	I <sub>sat</sub> 1 <sup>4</sup> (amps)	I <sub>sat</sub> 2 <sup>5</sup> (amps)	DCR (mΩ) ±5% @ 20°C	K-factor <sup>6</sup>
FP0906R1-R10-R	100	72	51	94	81	0.29	451
FP0906R1-R12-R	120	86	51	79	68	0.29	451
FP0906R1-R15-R	150	108	51	65	55	0.29	451
FP0906R1-R18-R	180	129	51	55	45	0.29	451
FP0906R1-R22-R	220	155	51	44	37.5	0.29	451
FP0906R1-R28-R	280	200	51	34	29	0.29	451
FP0906R1-R30-R	300	216	51	32.5	27.5	0.29	451

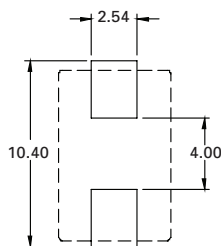
- Open Circuit Inductance (OCL) Test Parameters: 100kHz, 1.0Vrms, 0.0Aac, +25°C
- Full Load Inductance (FLL) Test Parameters: 100kHz, 1.0Vrms, I<sub>sat</sub>1, +25°C
- I<sub>rms</sub>: DC current for an approximate temperature rise of 40°C without core loss. Derating is necessary for AC currents. PCB 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.
- I<sub>sat</sub>1: Peak current for approximately 20% rolloff @ +25°C

- I<sub>sat</sub>2: Peak current for approximately 20% rolloff @ +125°C
- K-factor: Used to determine B<sub>pp</sub> for core loss (see graph). B<sub>pp</sub> = K \* L \* I \* 10<sup>-3</sup>. B<sub>pp</sub> (Gauss), K: (K-factor from table), L: (Inductance in nH), I (Peak to peak ripple current in Amps).
- Part Number Definition: FP0906Rx-Rxx-R  
FP0906 = Product code and size  
Rx= DCR indicator  
Rxx= Inductance value in uH, R= decimal point  
-R suffix = RoHS compliant

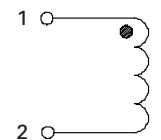
**Dimensions—mm**



Recommended Pad Layout



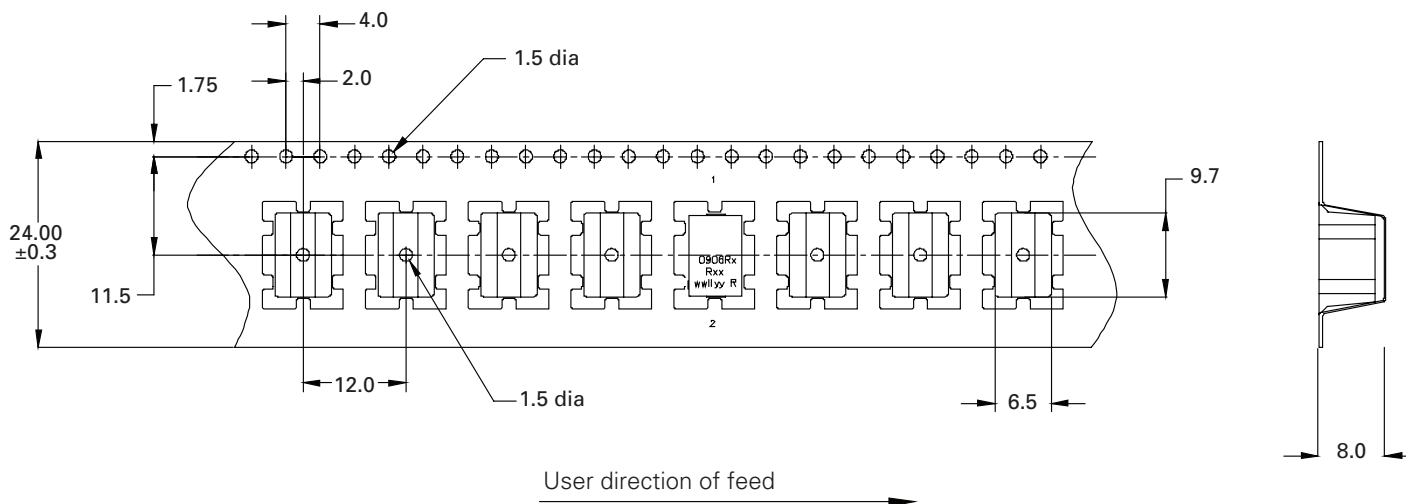
Schematic



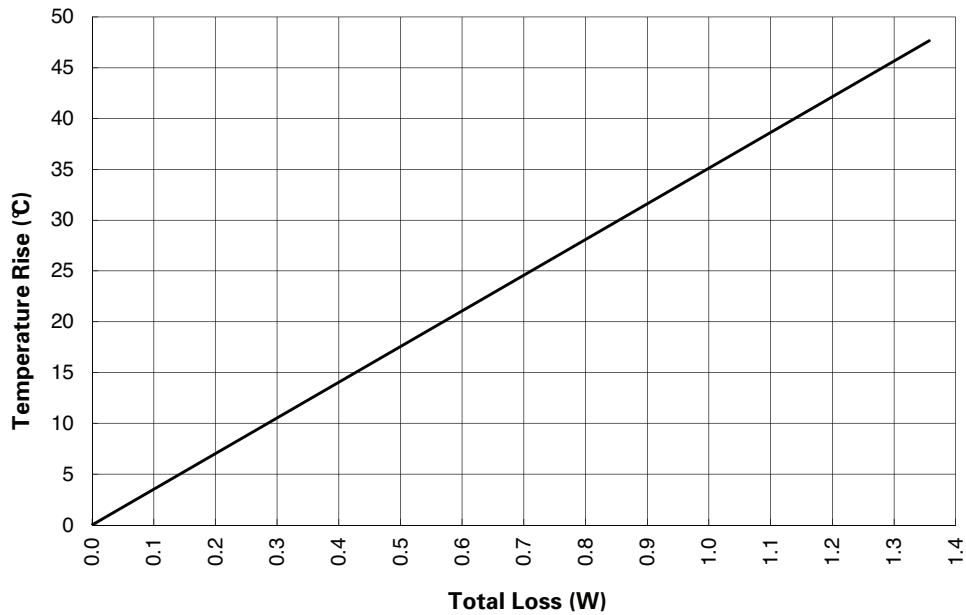
Part marking: 0906Rx (Rx=DCR indicator), Rxx=Inductance value in uH (R=decimal point), www=date code R=revision level  
The nominal DCR is measured between point "a" and point "b"  
Soldering surfaces to be coplanar within 0.1 millimeters  
Do not route traces or vias underneath the inductor

**Packaging—mm**

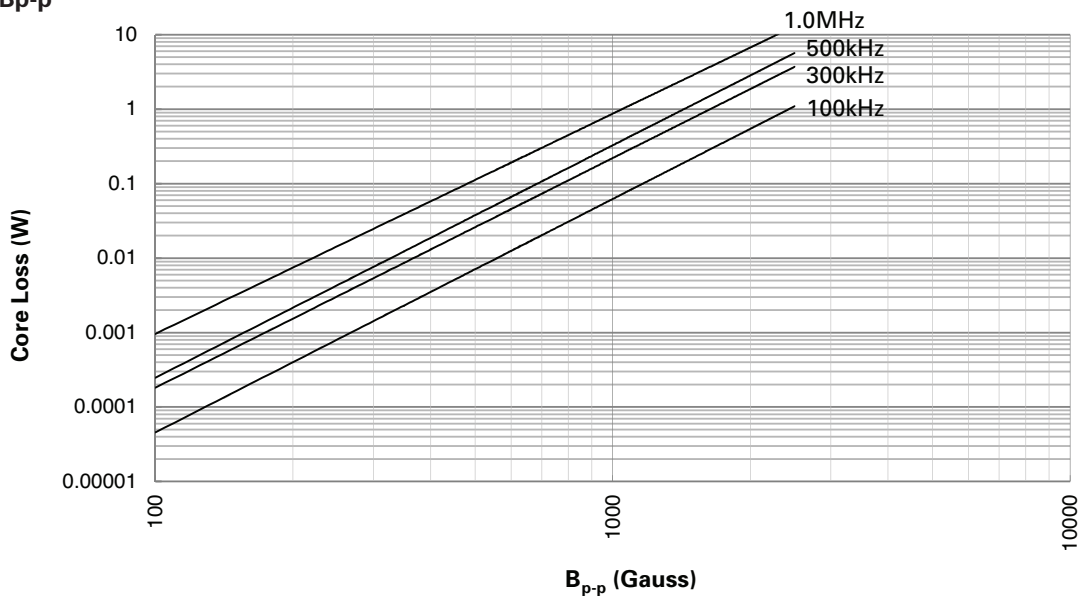
Supplied in tape and reel packaging , 600 parts per 13" diameter reel



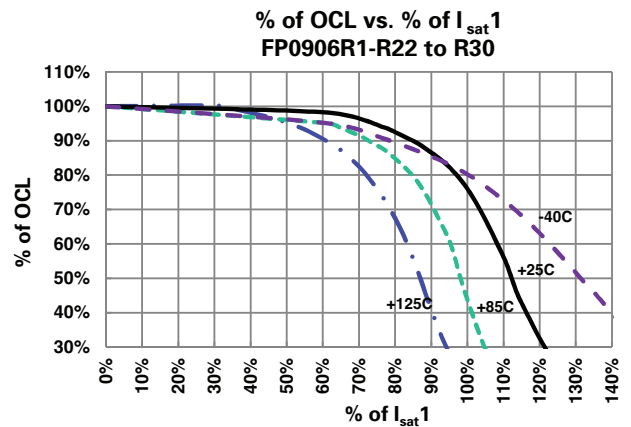
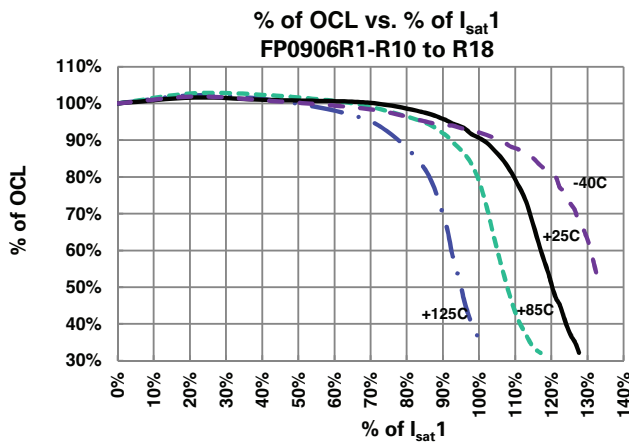
Temperature rise vs. total loss



Core loss vs Bp-p



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		
• 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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 Printed in USA  
 Publication No. 4407 BU-SB14111  
 June 2015

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