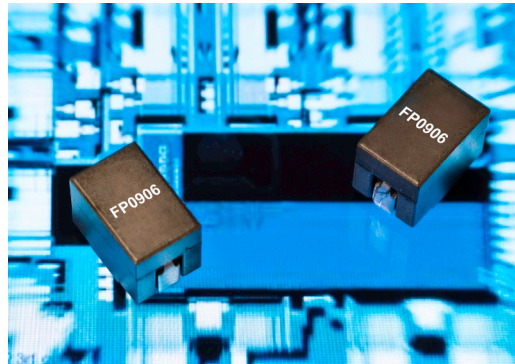


FP0906

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



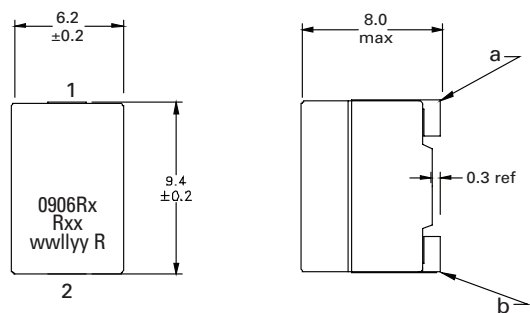
Product specifications

Part Number ⁷	OCL ¹ (nH) ±10%	FLL ² (nH) minimum	I _{rms} ³ (amps)	I _{sat} 1 ⁴ (amps)	I _{sat} 2 ⁵ (amps)	DCR (mΩ) ±5% @ 20°C	K-factor ⁶
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

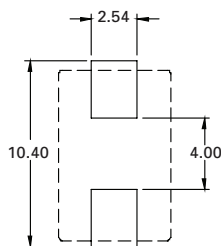
- Open Circuit Inductance (OCL) Test Parameters: 100kHz, 1.0Vrms, 0.0Aac, +25°C
- Full Load Inductance (FLL) Test Parameters: 100kHz, 1.0Vrms, I_{sat}1, +25°C
- I_{rms}: DC current for an approximate temperature rise of 40°C without core loss. Derating is necessary for AC currents. PCB layout, trace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

- I_{sat}2: Peak current for approximately 20% rolloff @ +125°C
- K-factor: Used to determine B_{pp} for core loss (see graph). B_{pp} = K * L * I * 10⁻³. B_{pp} (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

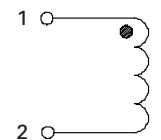
Dimensions—mm



Recommended Pad Layout



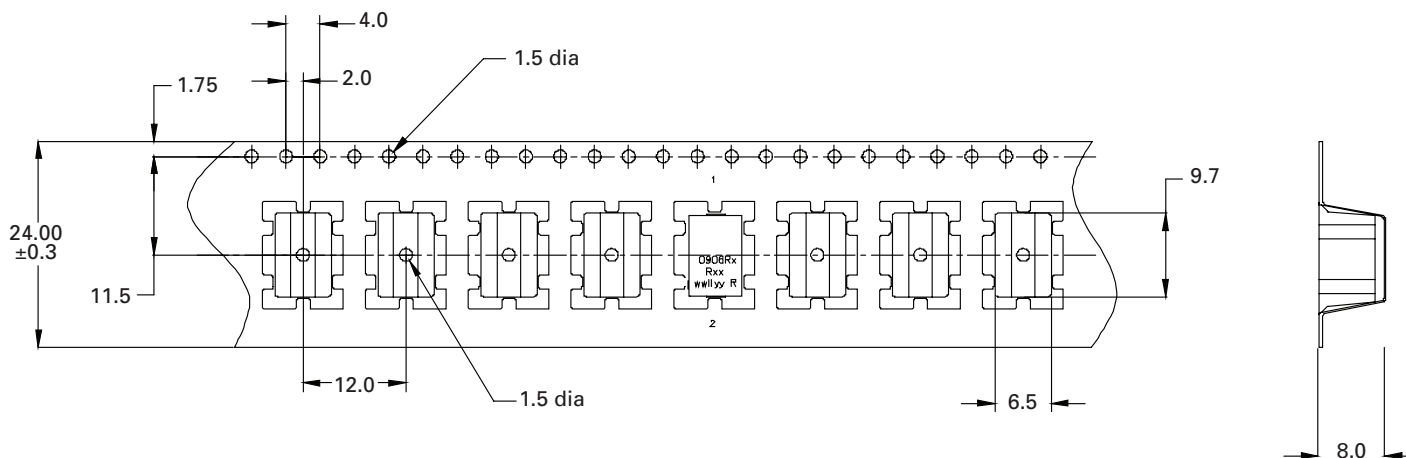
Schematic



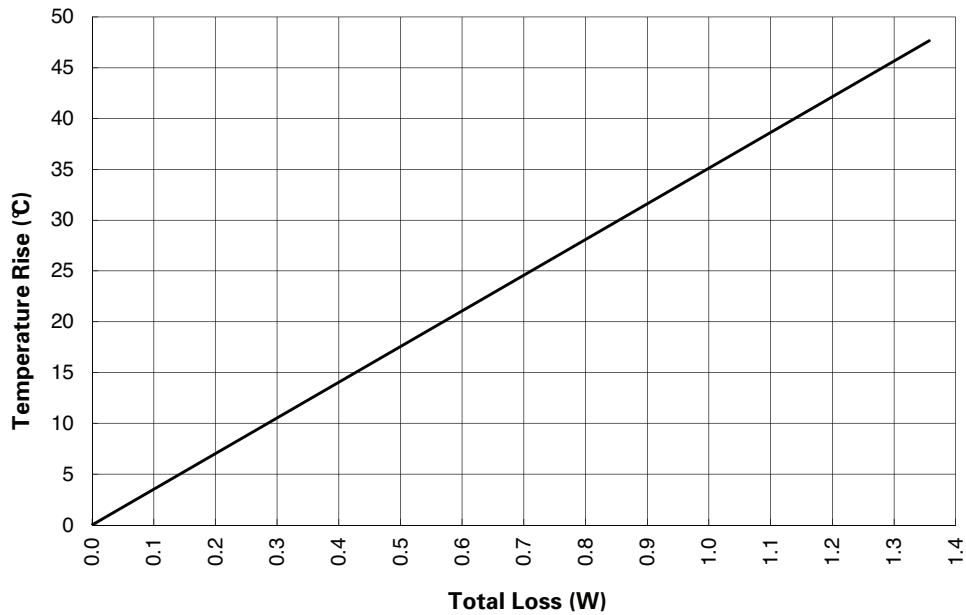
Part marking: 0906Rx (Rx=DCR indicator), Rxx=Inductance value in uH (R=decimal point), www=date code R=revision level
The nominal DCR is measured between point "a" and point "b"
Soldering surfaces to be coplanar within 0.1 millimeters
Do not route traces or vias underneath the inductor

Packaging—mm

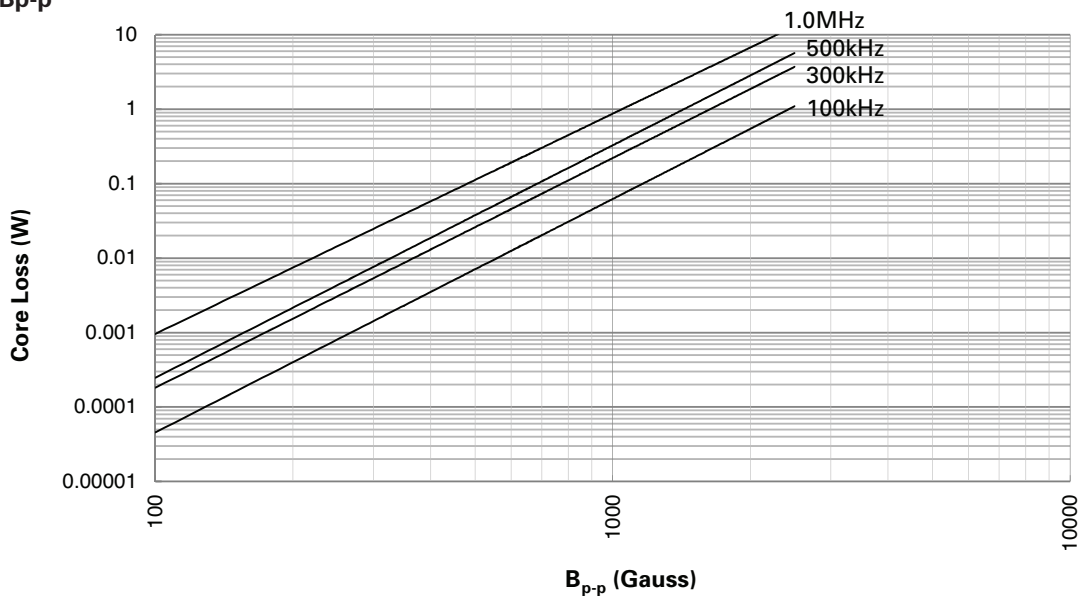
Supplied in tape and reel packaging , 600 parts per 13" diameter reel



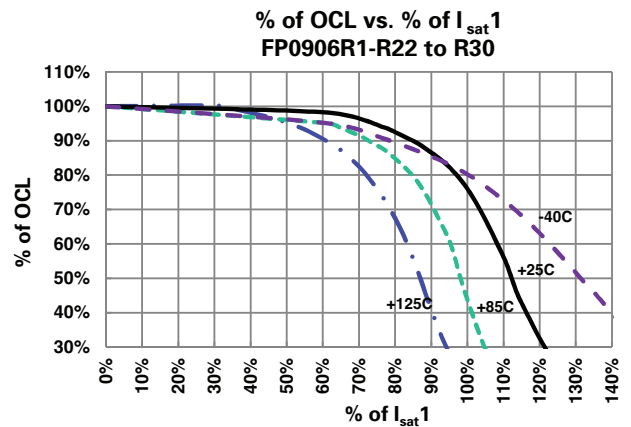
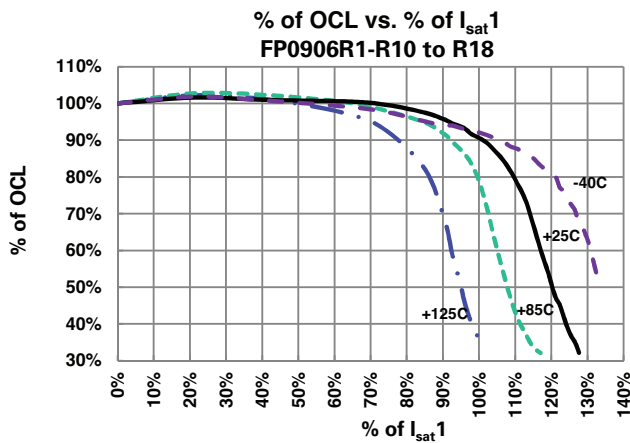
Temperature rise vs. total loss



Core loss vs Bp-p



Inductance characteristics



Solder reflow profile



Table 1 - Standard SnPb Solder (T_c)

Package Thickness	Volume mm ³ <350	Volume mm ³ ≥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 ³ <350	Volume mm ³ 350 - 2000	Volume mm ³ >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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