FP0905R

High frequency, high current power inductors



Product features

- High current carrying capacity
- Operating frequency range: up to 3 MHz
- 9.0 mm x 7.0 mm footprint surface mount package in 5.0 mm height
- Moisture sensitivity level (MSL): 1
- Ferrite core material
- Weight: 1.19 grams typical
- Termination finish: matte tin over nickel

Applications

- Multi-phase and Vcore regulators
- Voltage regulator modules (VRMs) and high power density VRMs
  - Server and desktop
  - Central processing unit (CPU)
  - Graphics processing unit (GPU)
  - Application specific integrated circuit (ASIC)
- Data networking and storage systems
- Graphics cards and battery power systems
- Point-of-Load modules

Environmental compliance and general specifications

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

Pb HALOGEN HF FREE RoHS

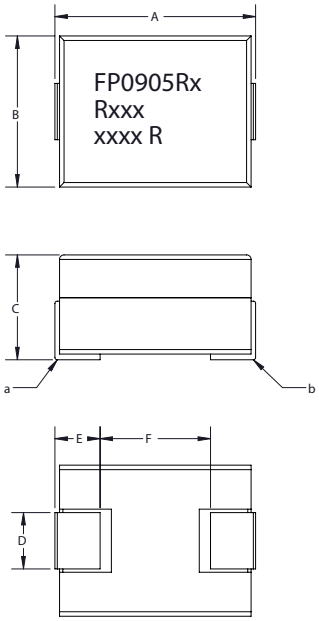
Powering Business Worldwide

Product specifications

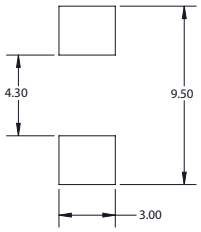
Part number[6]	OCL[1] (nH) ±10%	FLL[2] (nH) minimum	I_{rms}[3] (A) maximum	I_{sat}[4] (A)	K Factor[5]	DCR (mΩ) ± 6% @ +25 °C
FP0905R1-R150-R	150	120	47	42	610.8	0.37

1. Open circuit inductance (OCL) test parameters: 100 kHz, 0.1 V_{rms}, 0.0 Adc, +25 °C
2. Full load inductance (FLL) test parameters: 100 kHz, 0.1 V_{rms}, I_{sat}1 , +25 °C
3. 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.
4. I_{sat} : Peak current for approximately 20% rolloff @ +25 °C
5. K-factor: Used to determine Bp-p for core loss (see graph). Bp-p = K * L * ΔI * 10^{-3}. Bp-p:(Gauss), K: (K-factor from table), L: (Inductance in nH), ΔI (Peak to peak ripple current in Amps).
6. Part number definition: FP0905Rx-Rxxx-R
   FP0905R = Product code and size
   x = Version indicator
   Rxxx = Inductance value in µH, R = decimal point
   -R suffix = RoHS compliant

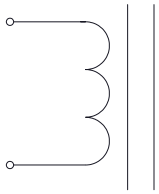
Dimensions-mm



Recommended pad layout



Schematic

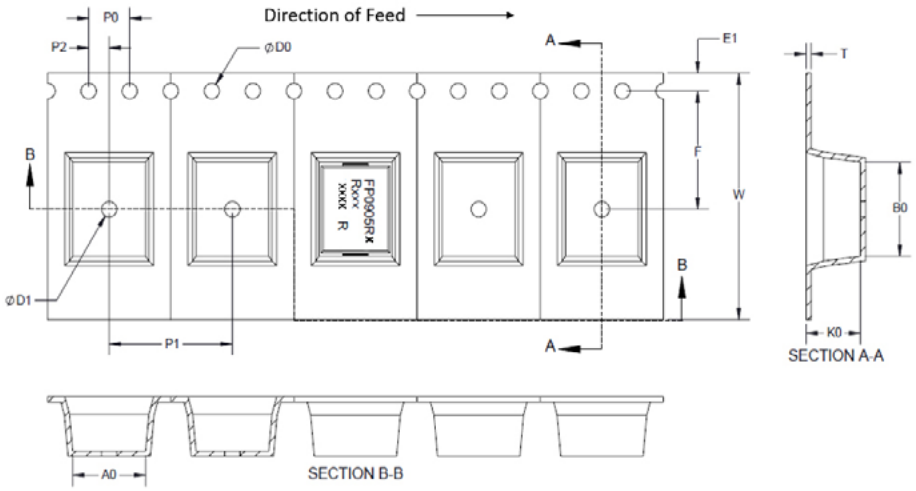


Part Number	A	B	C	D	E	F
FP00905Rx-Rxxx-R	7.0 maximum	7.0 maximum	5.0 maximum	2.5 nominal	2.0 nominal	4.9 nominal

Part marking: FP0905Rx = Product code and size, x = Version indicator, Rxxx = inductance value in uH, R = decimal point, xxxx = lot code, R= Revision level
Tolerances are ± 0.15 millimeters unless stated otherwise
All soldering surfaces to be coplanar within 0.1 millimeters
Pad layout tolerances are ± 0.1 millimeters unless stated otherwise
DCR is measured from point “a” to point “b”
Traces or vias underneath the inductor is not recommended

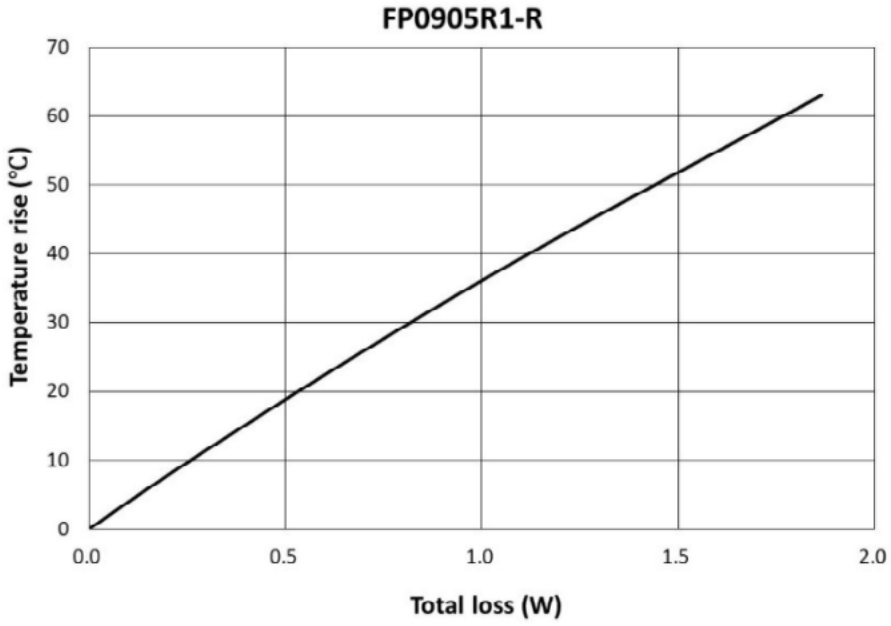
Packaging information- mm

Supplied in tape and reel packaging, 900 parts per 13" diameter reel

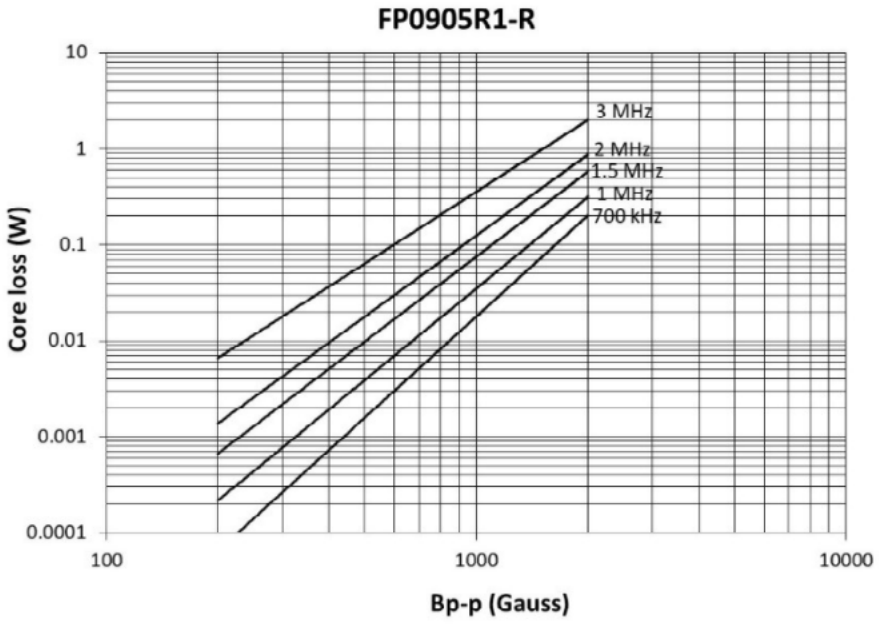


W±0.30	24.0
F±0.10	11.5
E1±0.10	1.75
P0±0.10	4.00
P1±0.10	12.0
P2±0.10	2.00
D0+0.10/-0	1.50
D1 Min	1.50
A0±0.10	7.1
B0±0.10	9.15
K0±0.10	5.3
T±0.05	0.40

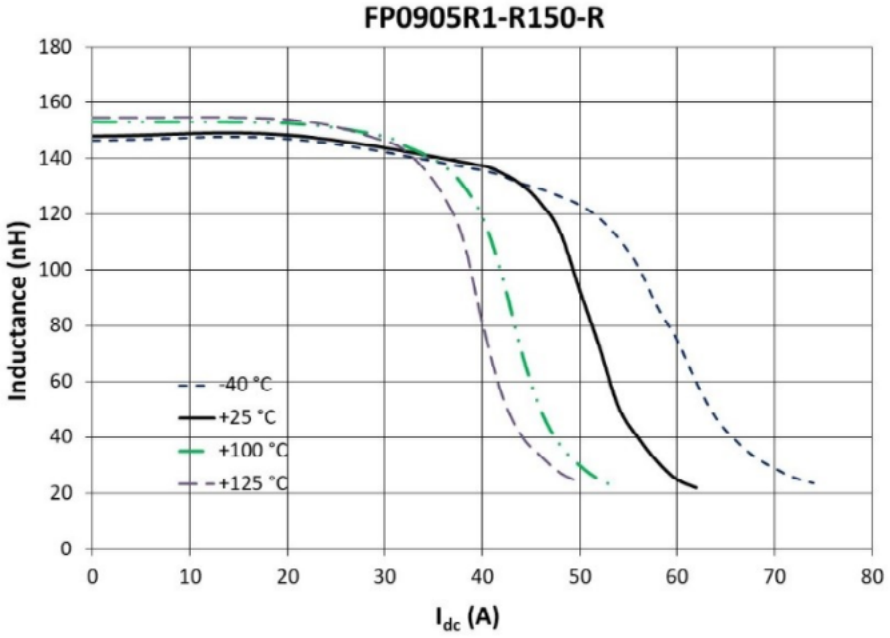
Temperature rise vs. total loss



Core loss vs Bp-p



Inductance characteristics



Solder reflow profile

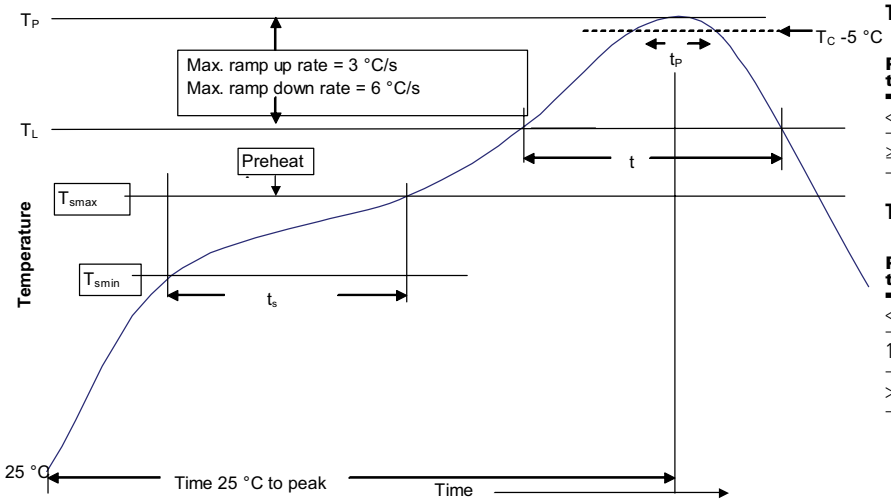


Table 1 - Standard SnPb solder (T_C)

Package thickness	Volume mm3 <350	Volume mm3 ≥350
<2.5 mm)	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2 - Lead (Pb) free solder (T_C)

Package thickness	Volume mm³ <350	Volume mm³ 350 - 2000	Volume mm³ >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Reference J-STD-020

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
Ramp up rate T_L to T_p		3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L		183 °C 60-150 seconds	217 °C 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*
Ramp-down rate (T_p to T_L)		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.

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Publication No. 11071 BU-MC20049
April 2020

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