

FP2207R

High frequency, high current power inductors



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 (POL)

Product features

- High current carrying capacity
- Low core loss
- Magnetically shielded
- 22.5 mm x 8.2 mm footprint surface mount-package in a 7.25 mm height
- Moisture Sensitivity Level: 1
- Ferrite core material

Environmental data

- Storage temperature range (Component): -55 °C to +125 °C
- Operating temperature range: -55 °C to +125 °C (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020 (latest revision) compliant
- Halogen free, lead free, RoHS compliant



Product Specifications

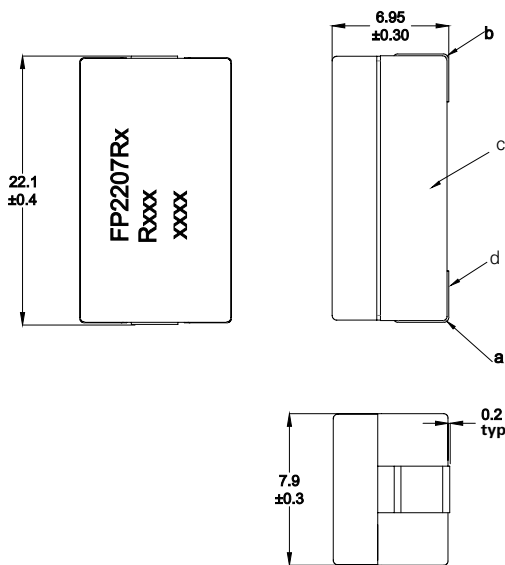
Part Number ⁸	OCL ¹ (nH) ±10%	FLL ² (nH) minimum	I _{rms} ³ (A)	I _{sat} 1 ⁴ (A)	I _{sat} 2 ⁵ (A)	I _{sat} 3 ⁶ (A)	DCR (mΩ) ±15% @ +20 °C	K-factor ⁷
FP2207R1-R230-R	230	196	50	70	77	72	0.47	182.5

R1 Version

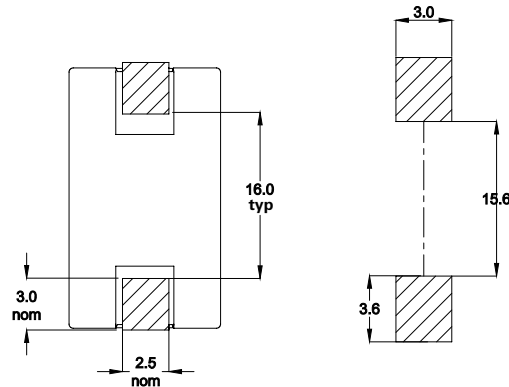
1. Open Circuit Inductance (OCL) Test Parameters: 1.0 MHz, 0.1 Vrms, 0.0 Adc, +25 °C
2. Full Load Inductance (FLL) Test Parameters: 1.0 MHz, 0.1 Vrms, I_{sat}1, +25 °C
3. I_{rms}: DC current for an approximate temperature rise of 40 °C without core loss. Derating is necessary for AC currents. PCB layout, 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}1: Peak current for approximately 5% rolloff @ +25 °C
5. I_{sat}2: Peak current for approximately 20% rolloff @ +100 °C
6. I_{sat}3: Peak current for approximately 20% rolloff @ +125 °C

7. K-factor: Used to determine B_{p-p} for core loss (see graph).
B_{p-p} = K * L * ΔI * 10⁻³ B_{p-p} (Gauss), K: (K-factor from table),
L: (Inductance in nH), ΔI (Peak to peak ripple current in Amps).
8. Part Number Definition: FP2207Rx-Rxxx-R
FP2207R= Product code and size
x= Version indicator
Rxxx= Inductance value in μH, R= decimal point
-R suffix = RoHS compliant
Note: Hipot: 250 Vdc minimum for 2 seconds, 0.1 mA conductor to uncoated core (test points c to d)

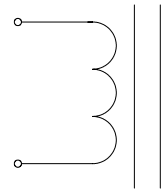
Dimensions (mm)



Recommended Pad Layout



Schematic



Part marking: FP2207Rx (x = Version indicator), Rxxx = Inductance value in uH, R= decimal point), xxxx=Lot code

Tolerances are ±0.15 unless stated otherwise

Pad layout tolerances are ±0.1 unless stated otherwise

Soldering surfaces to be coplanar within 0.1 millimeters

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

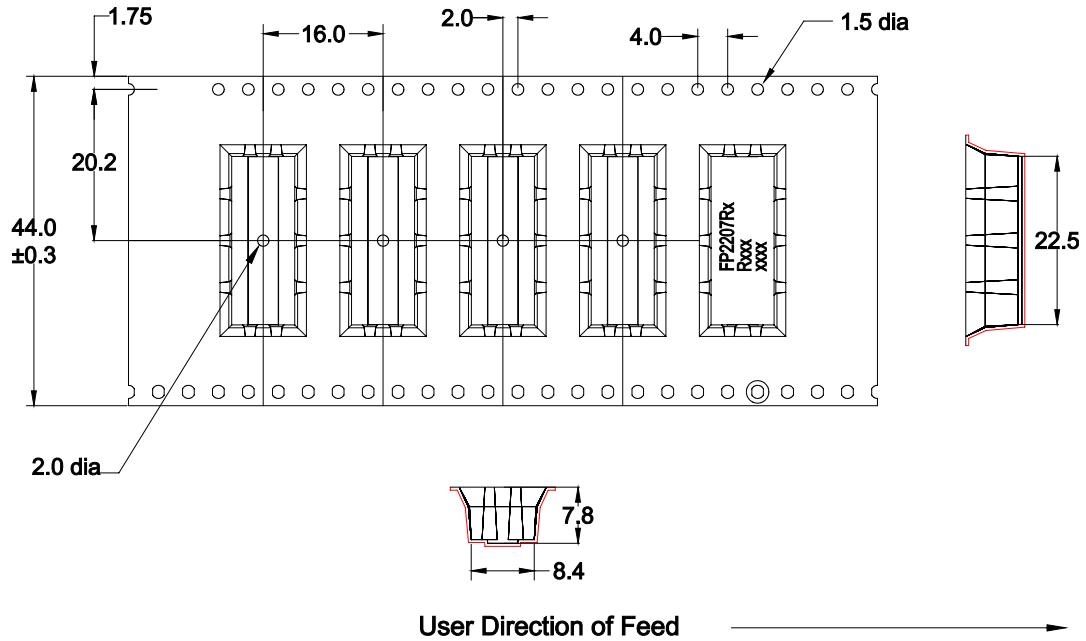
Hipot measured from point "c" to point "d"

Secure Inductor to PCB using Circuit Bond LV (or equivalent) adhesive for mechanical stability to meet Vibration, Mechanical shock and shear force requirements.

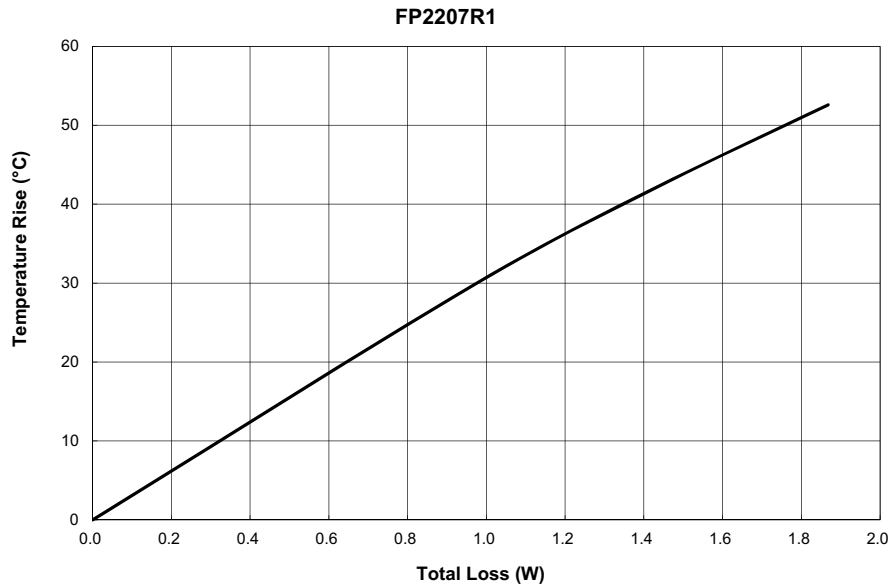
Do not route traces or vias underneath the inductor

Packaging information (mm)

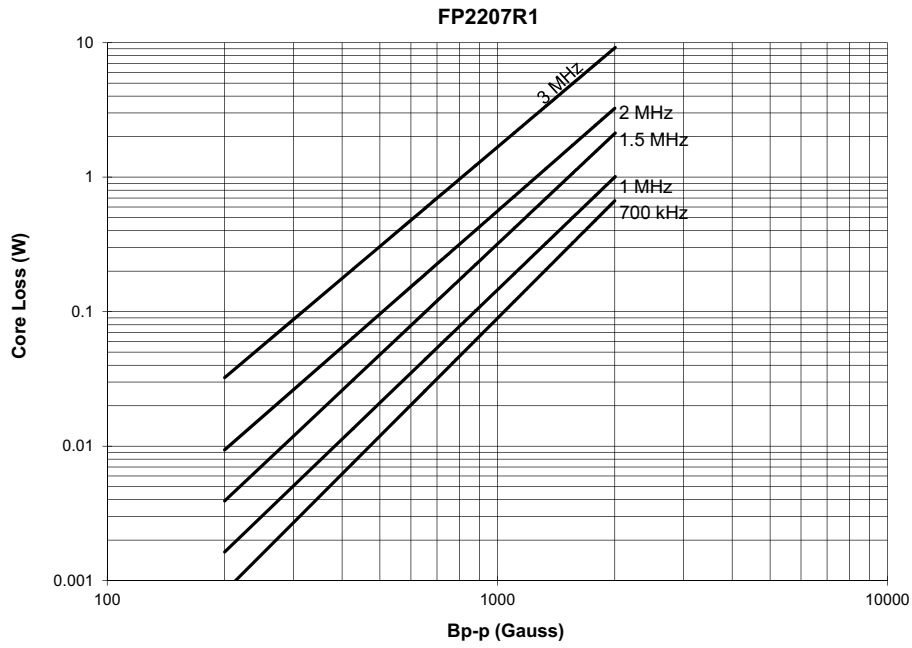
Supplied in tape and reel packaging , 500 parts per 13" diameter reel



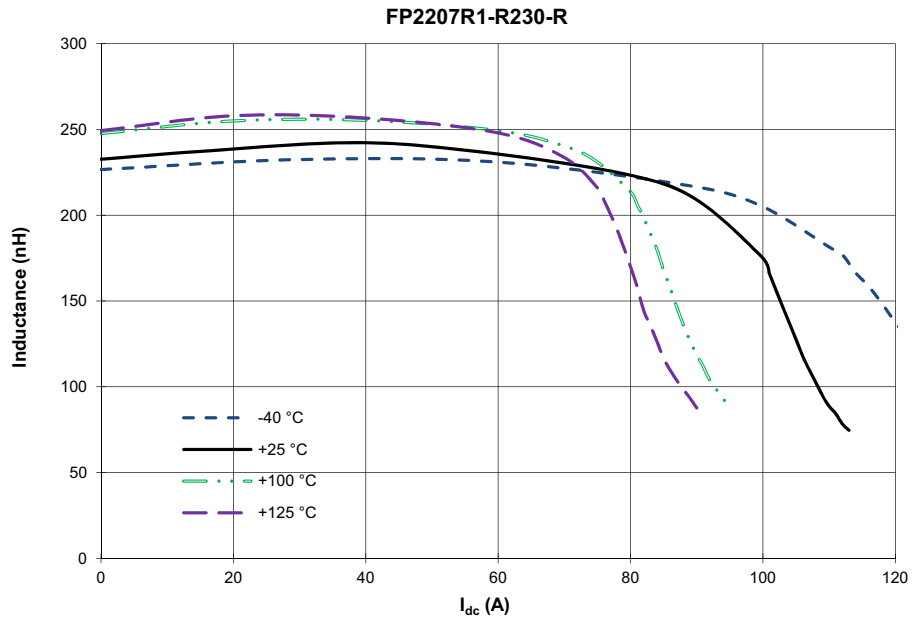
Temperature rise vs. total loss



Core loss vs. B_{p-p}



Inductance characteristics



Solder reflow profile

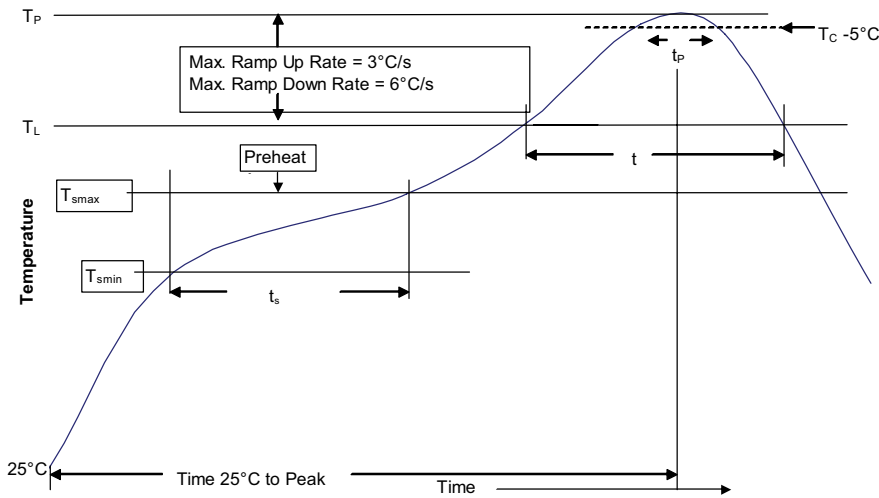


Table 1 - Standard SnPb Solder (T_C)

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-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
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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