High Frequency, High Current Power Inductors

Flat-Pac™ FP1208 Series

Description

- Halogen free, lead free, RoHS compliant
- 125°C maximum total temperature operation
- 12.1x8.0x8.0mm maximum surface mount package
- Ferrite core material
- Controlled DCR for sensing circuits
- Inductance range from 150nH to 250nH
- Current range from 44 to 85 Amps

Applications

- Multi-phase regulators
- Voltage Regulator Modules (VRMs)
- Desktop and server VRMs and EVRDs
- Notebook regulators
- 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

Packaging

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

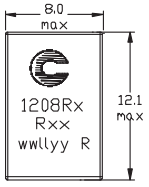
Product Specifications

Part Number[8]	OCL[1] (nH)±10%	FLL min.[2] (nH)	I_{rms}[3] (Amps)	$I_{sat}1$[4] (Amps)	$I_{sat}2$[5] (Amps)	$I_{sat}3$[6] (Amps)	DCR (mΩ) @ 20°C	K-factor[7]
FP1208R1-R15-R	150	114	50	85	79	72	0.29±5%	283
FP1208R1-R18-R	180	137		72	66	63		283
FP1208R1-R21-R	210	160		65	57	55		283
FP1208R1-R23-R	230	176		61	53	50		283
FP1208R1-R25-R	250	191		55	48	44		283

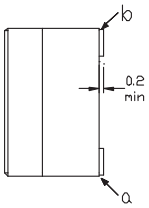
1. Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.1V_{rms}, 0.0Adc@25°C
2. Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1V_{rms}, $I_{sat}1$
3. I_{rms}: DC current for an approximate temperature rise of 40°C without core loss. Derating is necessary for AC currents. PCB layout, trace 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 20% rolloff @ 25°C
5. $I_{sat}2$: Peak current for approximately 20% rolloff @ 85°C
6. $I_{sat}3$: Peak current for approximately 20% rolloff @ 125°C
7. K-factor: Used to determine Bp-p for core loss (see graph). $B_{p-p} = K * L * \Delta I * 10^{-3}$. 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: FP1208Rx-Rxx-R:
   - FP1208= Product code and size
   - Rx= DCR indicator
   - Rxx= Inductance value in µH
   - “-R” suffix = RoHS compliant

Dimensions - mm

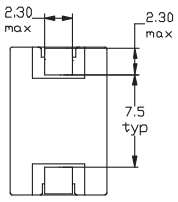
Top View



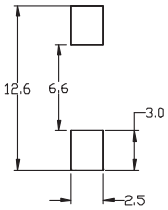
Side View



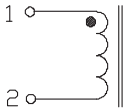
Bottom View



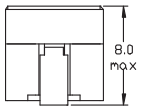
Recommended Pad Layout



Schematic

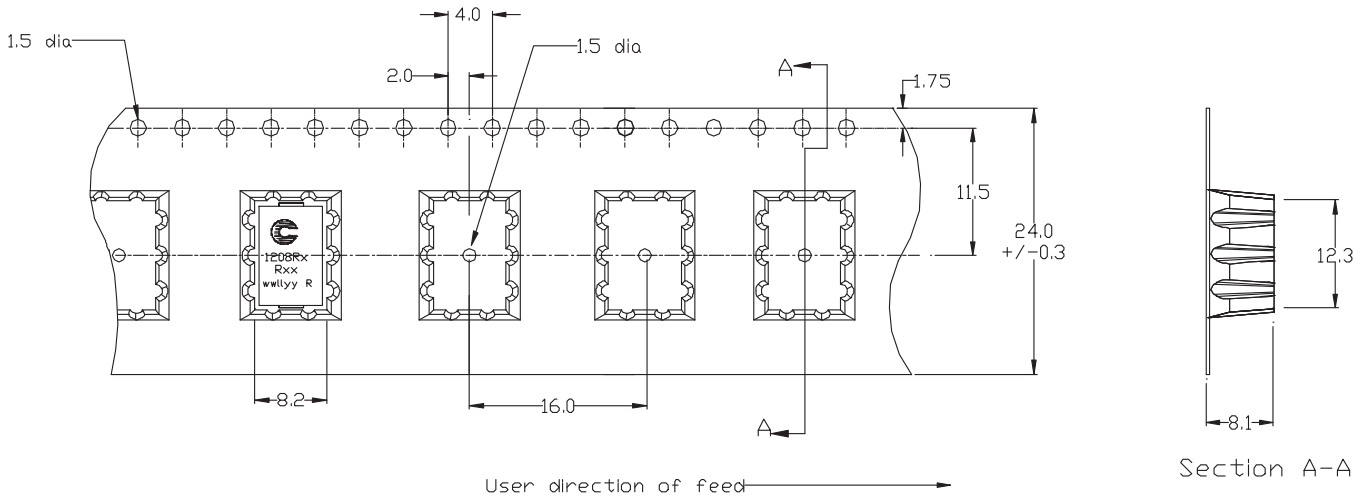


Front View



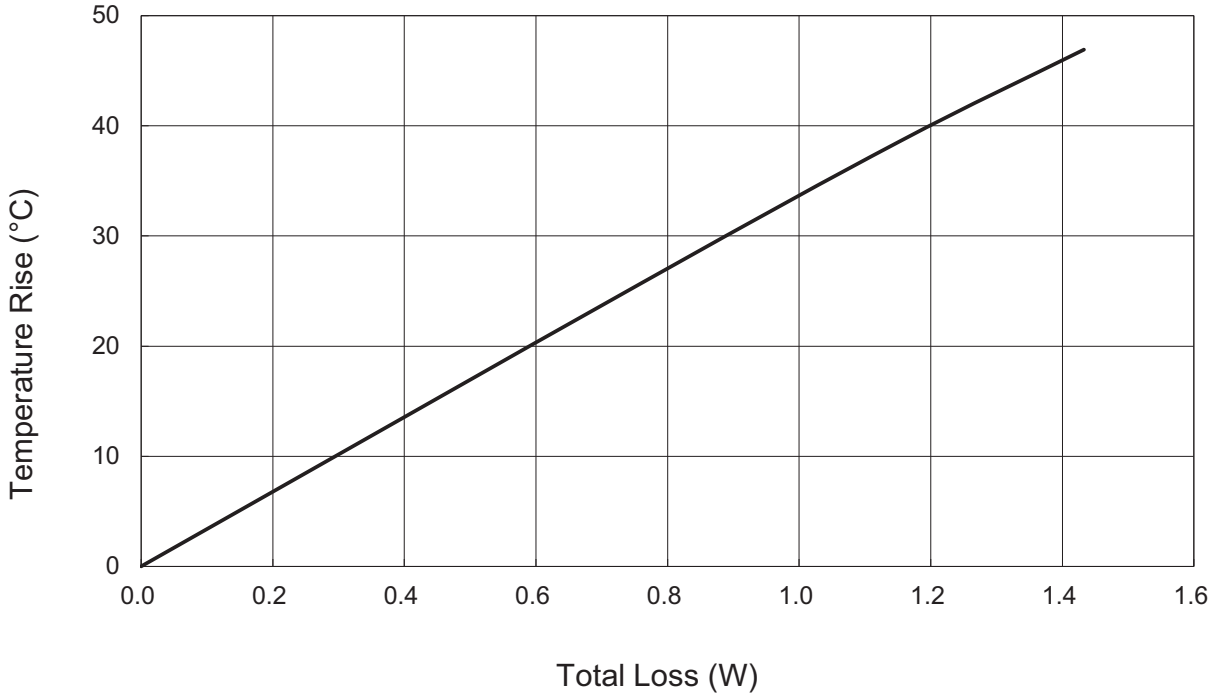
DCR measured from point “a” to point “b”
Part marking: Coiltronics logo, 1208Rx (Rx= DCR indicator), Rxx = Inductance value in uH (R= decimal point)
wwllyy= date code, r= revision level
Tolerances are +/- 0.15 millimeters unless stated otherwise.
PCB tolerances are +/- 0.10 millimeters unless stated otherwise.
All soldering surfaces to be be coplanar within 0.1 millimeters.

Packaging Information - mm

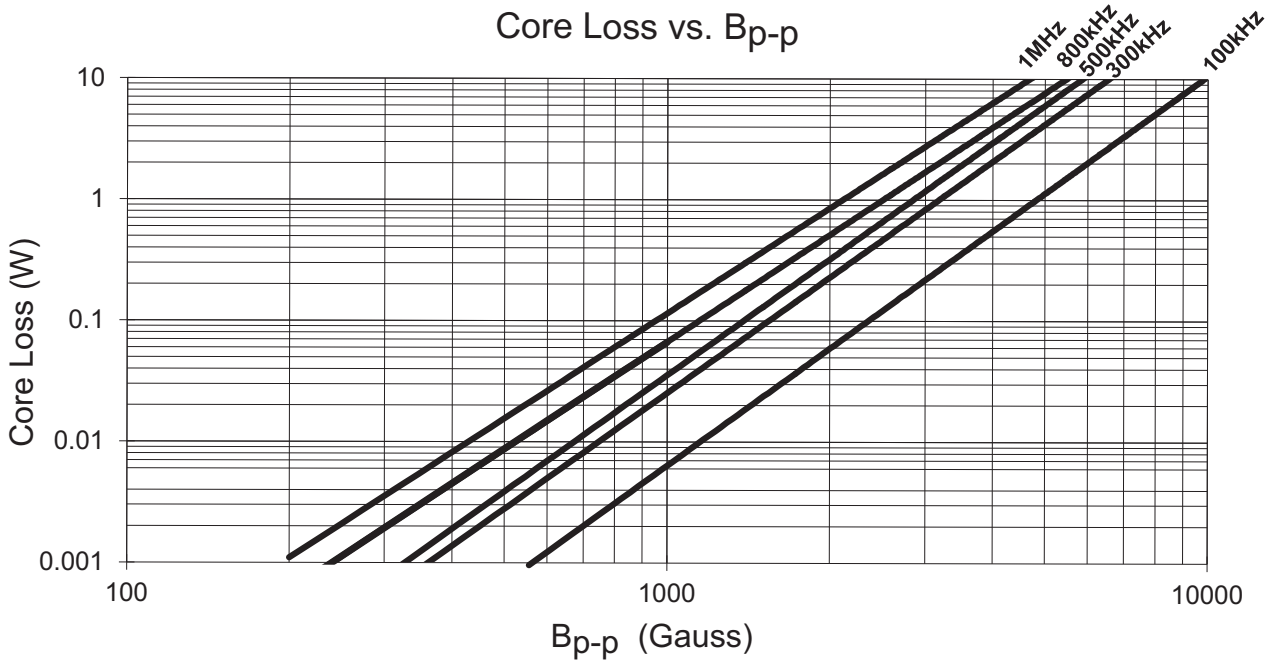


Supplied in tape and reel packaging, 500 parts on a 13” diameter reel.

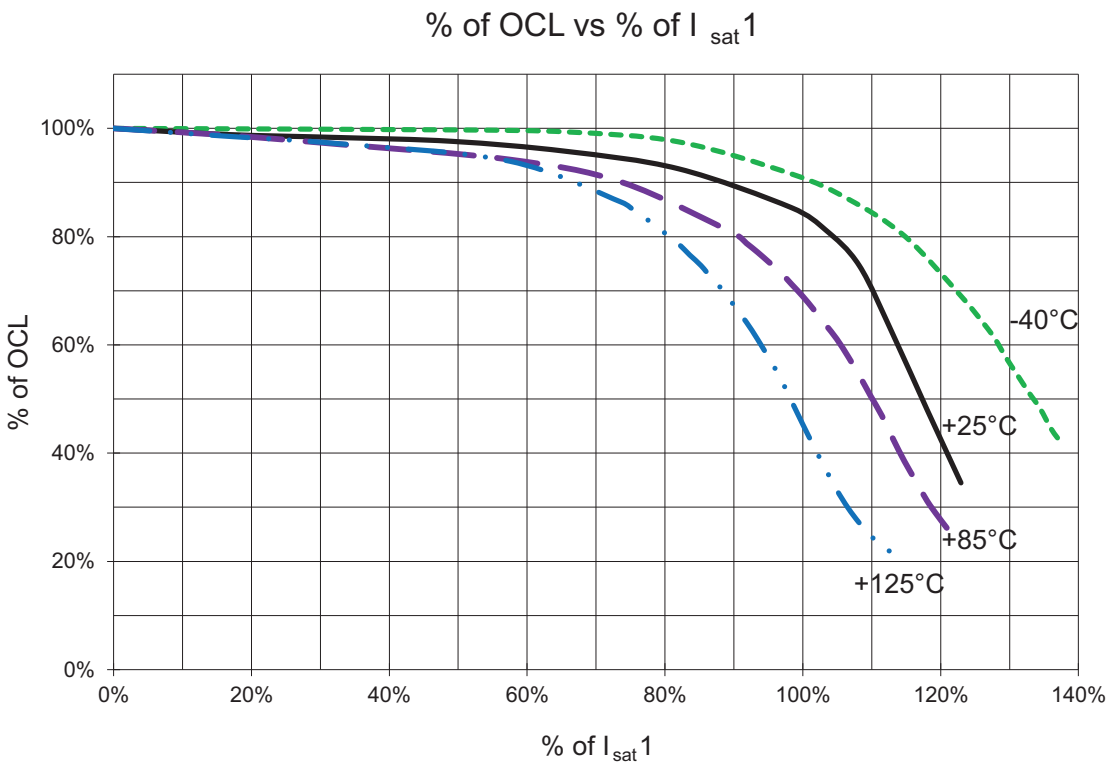
Temperature Rise vs. Total Loss



Core Loss



Inductance Characteristics



Solder Reflow Profile

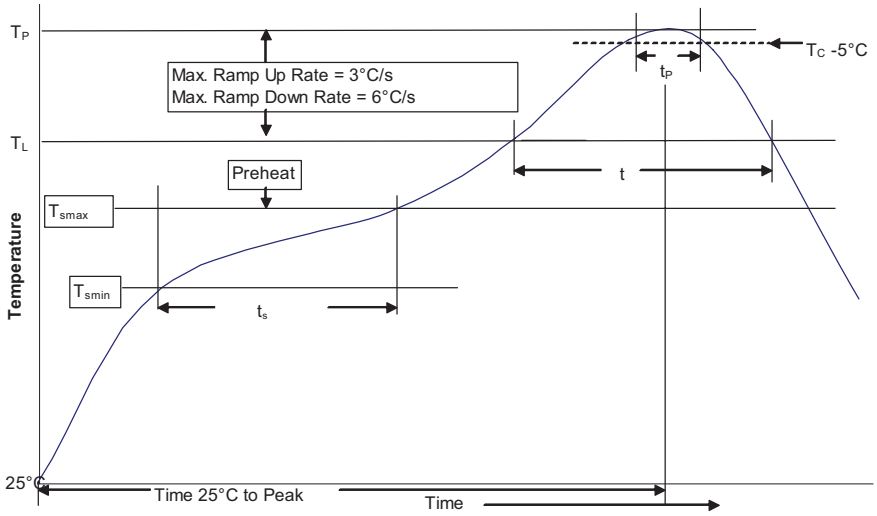


Table 1 - Standard SnPb Solder (T_C)

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

Table 2 - Lead (Pb) Free Solder (T_C)

Package Thickness	Volume mm³ <350	Volume mm³ 350 - 2000	Volume mm³ >2000
<1.6mm	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) Time at liquidous (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**
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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