# FP1208

## High frequency, high current power inductors


### Product features

- 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
- Halogen free, lead free, RoHS compliant

### Applications

- Multi-phase 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 plus self-temperature rise)
- Solder reflow temperature: J-STD-020 (latest revision) compliant

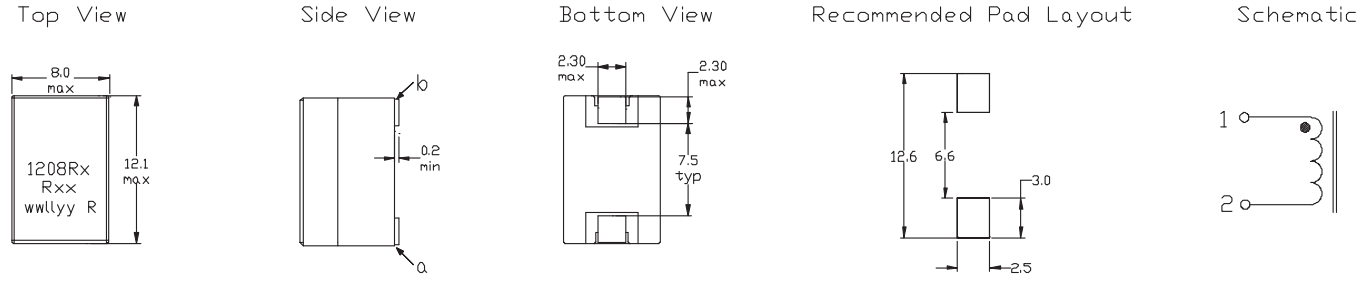
Pb HALOGEN HF FREE RoHS

Powering Business Worldwide

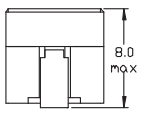
| Product Specifications | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Part Number [8] | OCL [1] (nH)±10% | FLL min. [2] (nH) | $I_{rms}$ [3] (Amps) | $I_{sat}1$ [4] (Amps) | $I_{sat}2$ [5] (Amps) | $I_{sat}3$ [6] (Amps) | DCR (mΩ) @ 20°C | K-factor [7] |
| FP1208R1-R15-R | 150 | 114 | 50 | 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, 0.1$V_{rms}$, 0.0Adc@25°C
2. Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1$V_{rms}$, $I_{sat}1$
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). $B_{p\text{-}p} = K * L * \Delta I * 10^{-3}$. $B_{p\text{-}p}$:(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

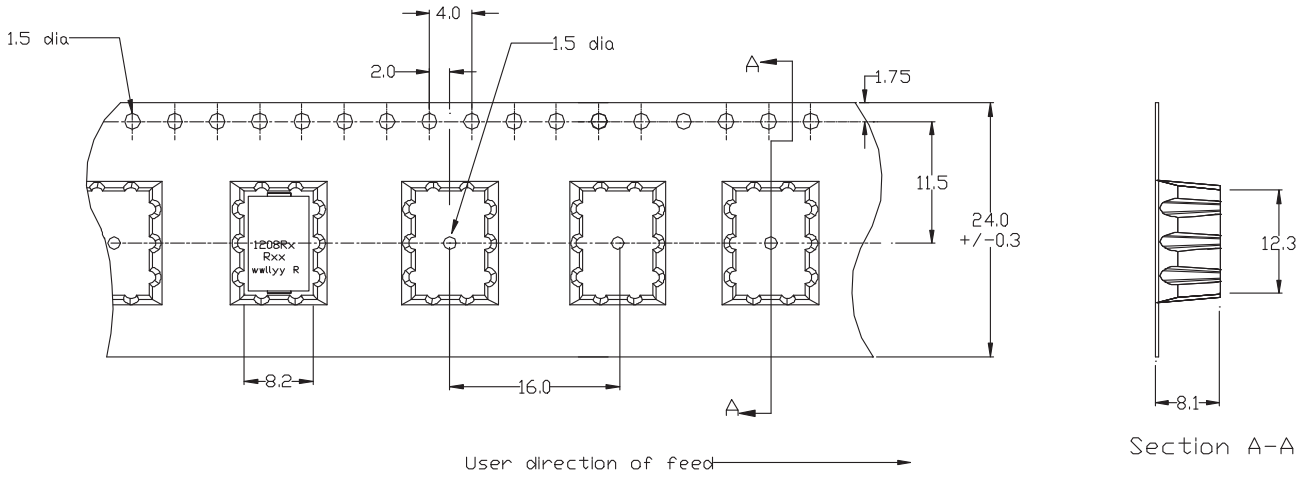



Front View



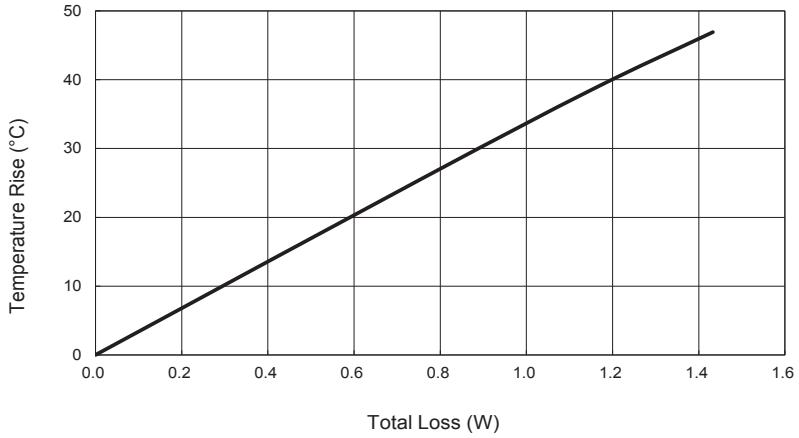

DCR measured from point "a" to point "b"
Part marking: 1208Rx (Rx= DCR indicator), Rxx = Inductance value in uH (R= decimal point) wwllyy= date code, r= revision level
Tolerances are +/- 0.15 millimeters unless stated otherwise.
PCB tolerances are +/- 0.10 millimeters unless stated otherwise.
All soldering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

## Packaging information - mm

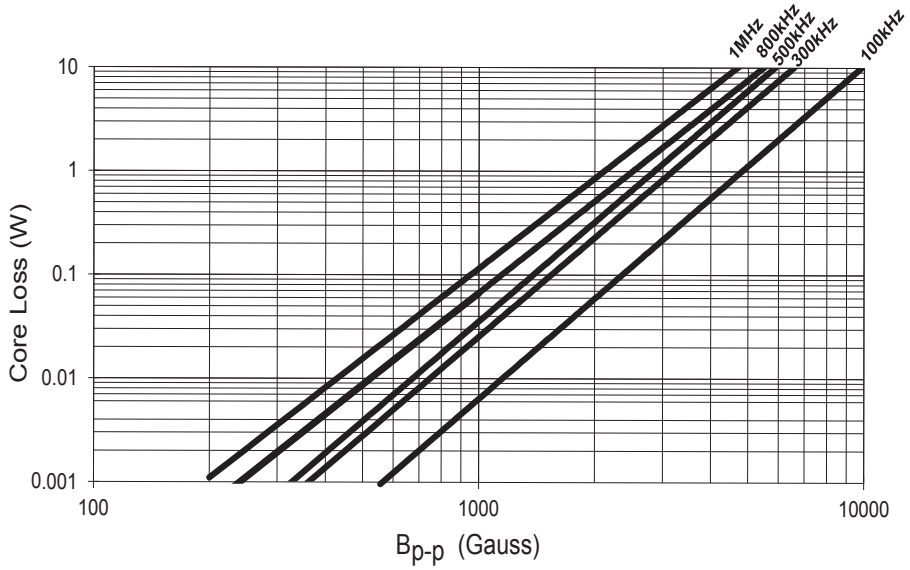



Supplied in tape and reel packaging, 500 parts on a 13" diameter reel.

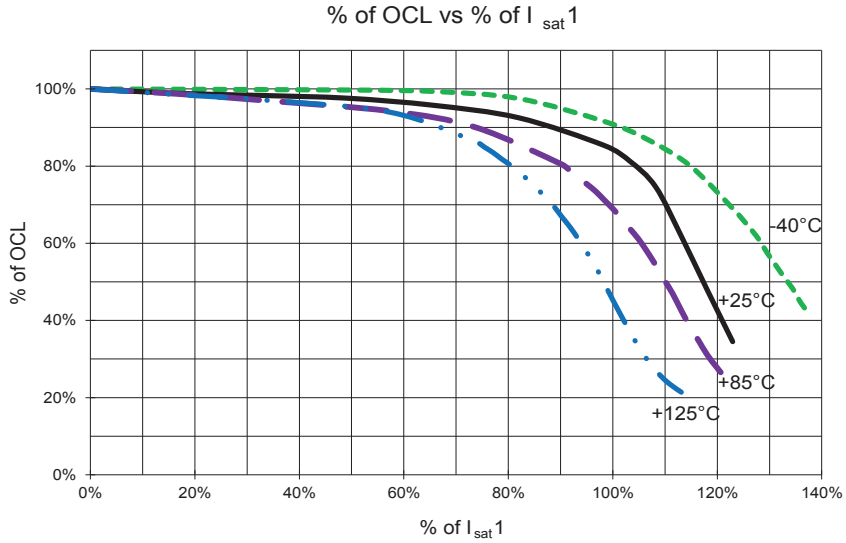
### Temperature rise vs total loss



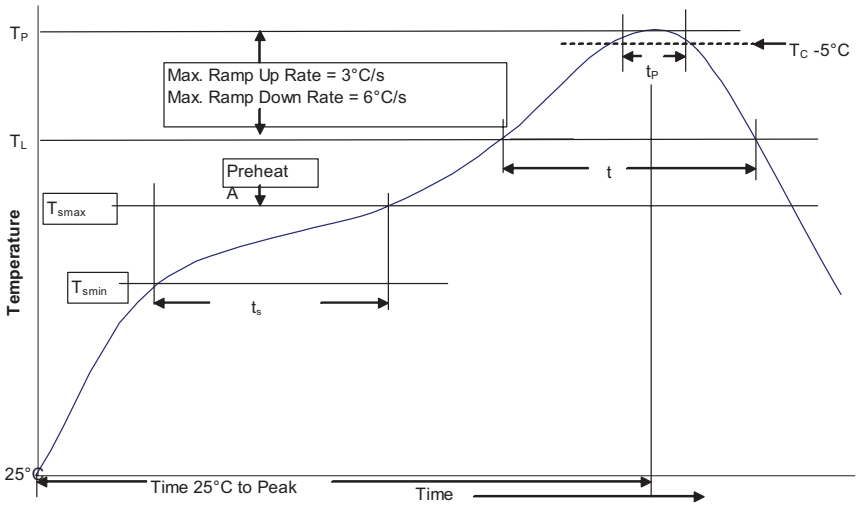

### Core loss vs Bp-p




### 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-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 ($T_L$)<br>Time at liquidous ($t_L$) | | 183°C<br>60-150 Seconds | 217°C<br>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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