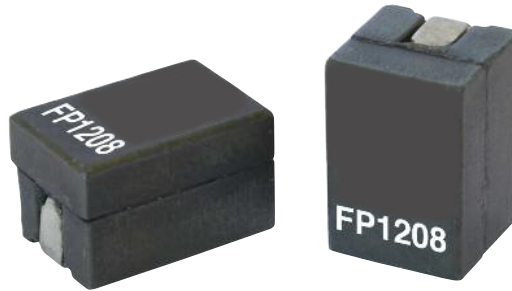


# FP1208

## 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



Product Specifications								
Part Number <sup>8</sup>	OCL <sup>1</sup> (nH)±10%	FLL min. <sup>2</sup> (nH)	I <sub>rms</sub> <sup>3</sup> (Amps)	I <sub>sat</sub> 1 <sup>4</sup> (Amps)	I <sub>sat</sub> 2 <sup>5</sup> (Amps)	I <sub>sat</sub> 3 <sup>6</sup> (Amps)	DCR (mΩ) @ 20°C	K-factor <sup>7</sup>
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<sub>rms</sub>, 0.0Adc@25°C

2. Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1V<sub>rms</sub>, I<sub>sat</sub>1

3. I<sub>rms</sub>: 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<sub>sat</sub>1: Peak current for approximately 20% rolloff @ 25°C

5. I<sub>sat</sub>2: Peak current for approximately 20% rolloff @ 85°C

6. I<sub>sat</sub>3: Peak current for approximately 20% rolloff @ 125°C

7. K-factor: Used to determine B<sub>p-p</sub> for core loss (see graph). B<sub>p-p</sub> = K \* L

\*  $\Delta I \cdot 10^{-3}$ . B<sub>p-p</sub>:(Gauss), K: (K-factor from table), L: (Inductance in nH),  $\Delta I$  (Peak to peak ripple current in Amps).

8. Part Number Definition: FP1208Rx-Rxx-R:

- FP1208= Product code and size

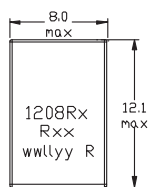
- Rx= DCR indicator

- Rxx= Inductance value in  $\mu$ H

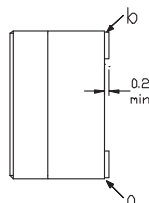
- "-R" suffix = RoHS compliant

### Dimensions- mm

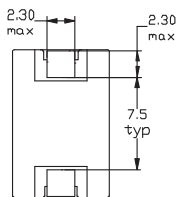
Top View



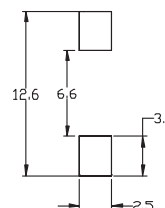
Side View



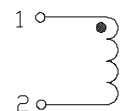
Bottom View



Recommended Pad Layout



Schematic



Front View



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

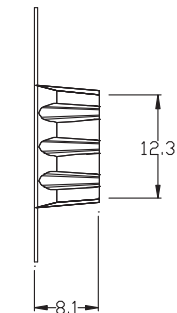
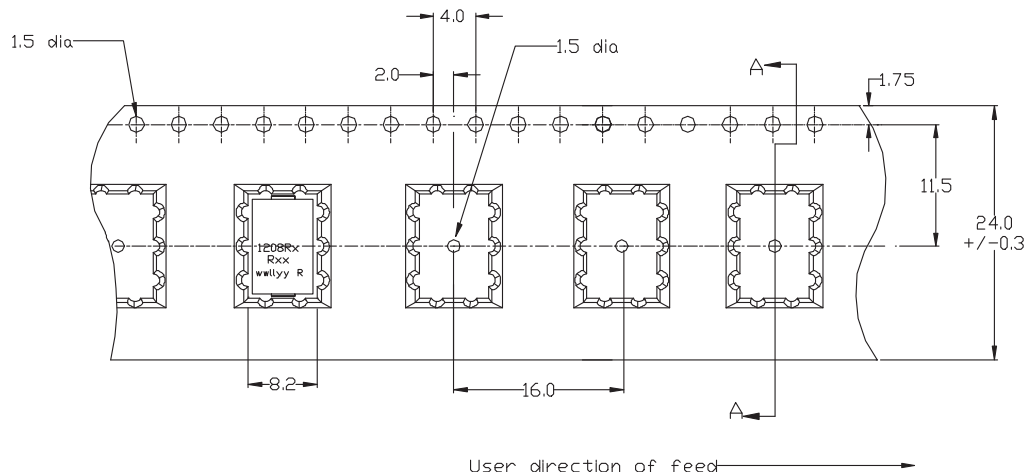
Part marking: 1208Rx (Rx= DCR indicator), Rxx = Inductance value in  $\mu$ H (R= decimal point) wllly= date code, r= revision level

Tolerances are +/- 0.15 millimeters unless stated otherwise.

PCB tolerances are +/- 0.10 millimeters unless stated otherwise.

All soldering surfaces to be coplanar within 0.1 millimeters.

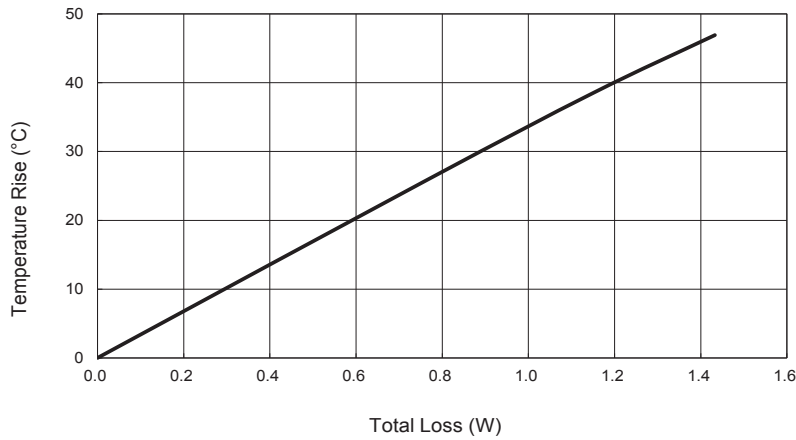
### Packaging information - mm



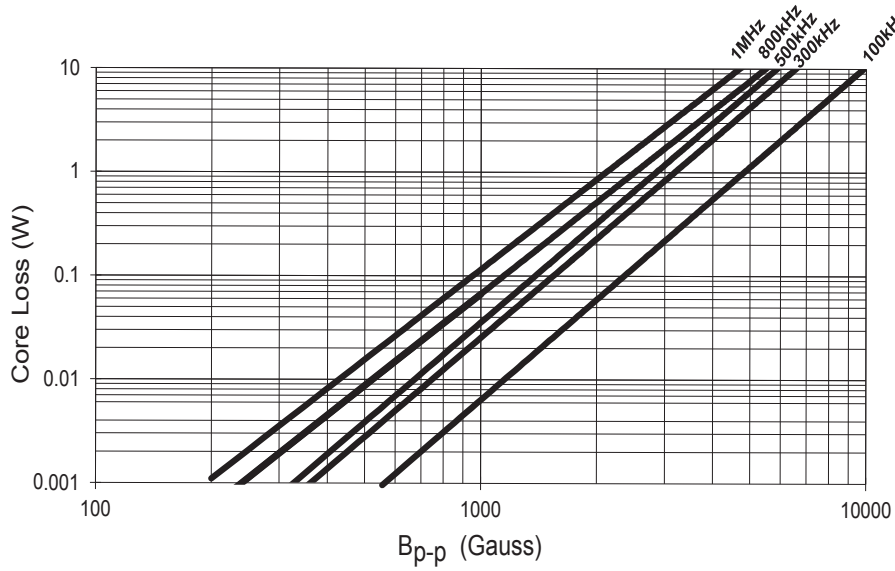
Section A-A

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

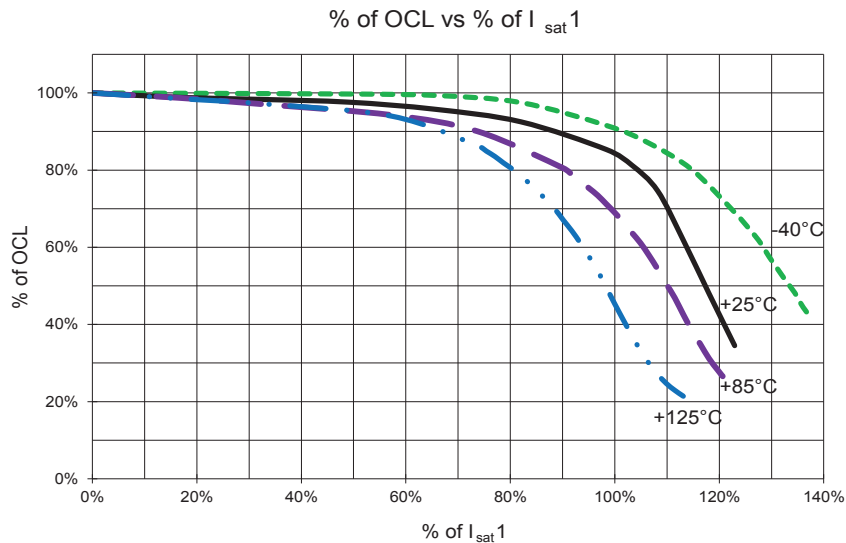
**Temperature rise vs total loss**



**Core loss vs Bp-p**



**Inductance characteristics**



### Solder Reflow Profile

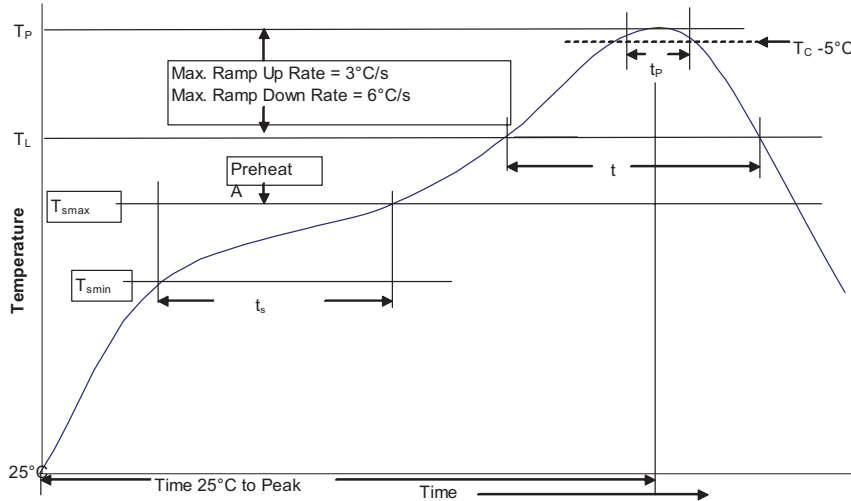


Table 1 - Standard SnPb Solder ( $T_c$ )

Package Thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ $\geq 350$
<2.5mm	235°C	220°C
$\geq 2.5\text{mm}$	220°C	220°C

Table 2 - Lead (Pb) Free Solder ( $T_c$ )

Package Thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ 350 - 2000	Volume $\text{mm}^3$ >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
	• Temperature max. ( $T_{smax}$ )	150°C
	• Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	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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