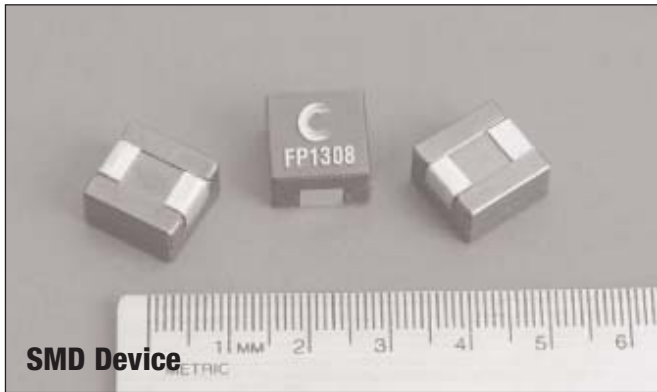


# High Current, High Frequency, Power Inductors

## FLAT-PAC™ FP1308 Series



SMD Device

### Description

- Halogen Free
- 125°C maximum total operating temperature
- 12.9 x 13.7 x 8.0mm surface mount package
- High current handling capability, compact footprint
- Ferrite core material
- Inductance range from 0.110μH to 0.440μH
- Current range from 32 to 120 amps
- Frequency range up to 2MHz

### Applications

- Voltage regulator modules (VRMs) for servers and microprocessors
- Multi-phase buck inductors
- High frequency, high current switching power supplies

### Environmental Data

- Storage temperature range: -40°C to +125°C
- Operating temperature range: -40°C to +125°C (range is application specific)
- Solder reflow temperature: +260°C max. for 10 seconds maximum

### Packaging

- Supplied in tape-and-reel packaging, 400 parts per reel, 13" diameter reel



### Product Specifications

Part Number <sup>5</sup>	Rated Inductance (μH)	OCL <sup>1</sup> ± 10% (μH)	I <sub>rms</sub> <sup>2</sup> (Amps)	I <sub>sat</sub> <sup>3</sup> (Amps)	DCR (mΩ) @ 25°C Typical	DCR (mΩ) @ 25°C Max	K-factor <sup>4</sup>
FP1308-R11-R	0.110	0.110	68	120	0.20	0.24	21.330
FP1308-R21-R	0.210	0.210	68	72	0.20	0.24	21.333
FP1308-R26-R	0.260	0.260	68	60	0.20	0.24	21.335
FP1308-R32-R	0.320	0.320	68	45	0.20	0.24	21.340
FP1308-R44-R	0.440	0.440	68	32	0.20	0.24	21.366

1 Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.10V<sub>rms</sub>, 0.0Adc

2 I<sub>rms</sub>: DC current for an approximate temperature rise of 40°C without core loss. Derating is necessary for AC currents. PCB pad layout, trace thickness and width, air-flow and proximity of other heat generating components will affect the temperature rise. It is recommended the part temperature not exceed 125°C under worst case operating conditions verified in the end application.

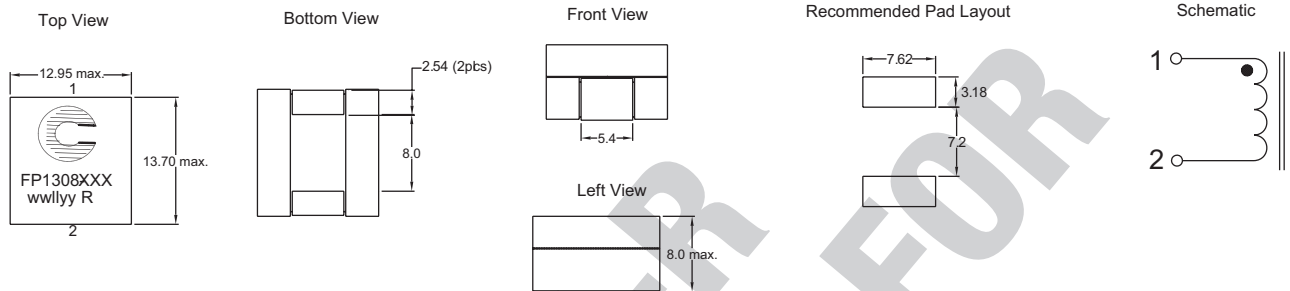
3 I<sub>sat</sub>: Peak current for approximately 20% rolloff at +25°C.

4 K-factor: Used to determine B<sub>p-p</sub> for core loss (see graph). B<sub>p-p</sub> = K • L • ΔI. B<sub>p-p</sub> (mT): (Gauss), K: (K-factor from table), L: (inductance in μH), ΔI (peak-to-peak ripple current in amps).

5 Part Number Definition: FP1308-xxx-R

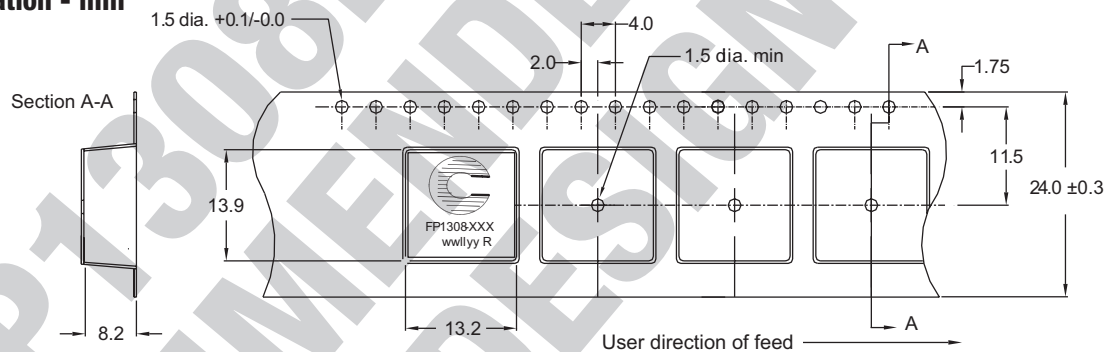
- FP1308 = Product code and size
- xxx= Inductance value in μH, R = decimal point. If no "R" is present, then third character = # of zeros.
- "-R" suffix = RoHS compliant

### Dimensions - mm



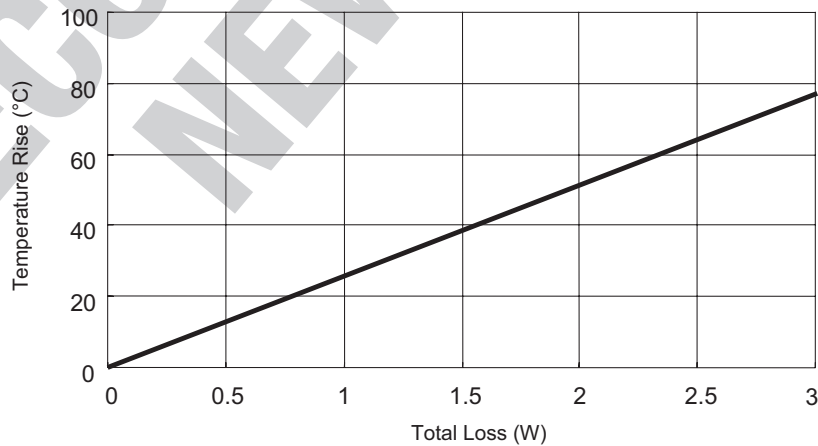
Part Marking: FP1308      xxx = Inductance value in  $\mu\text{H}$ . (R = Decimal point). If no "R" is present, then last character is # Of zeros      wllly = Date code      R = Revision level

### Packaging Information - mm

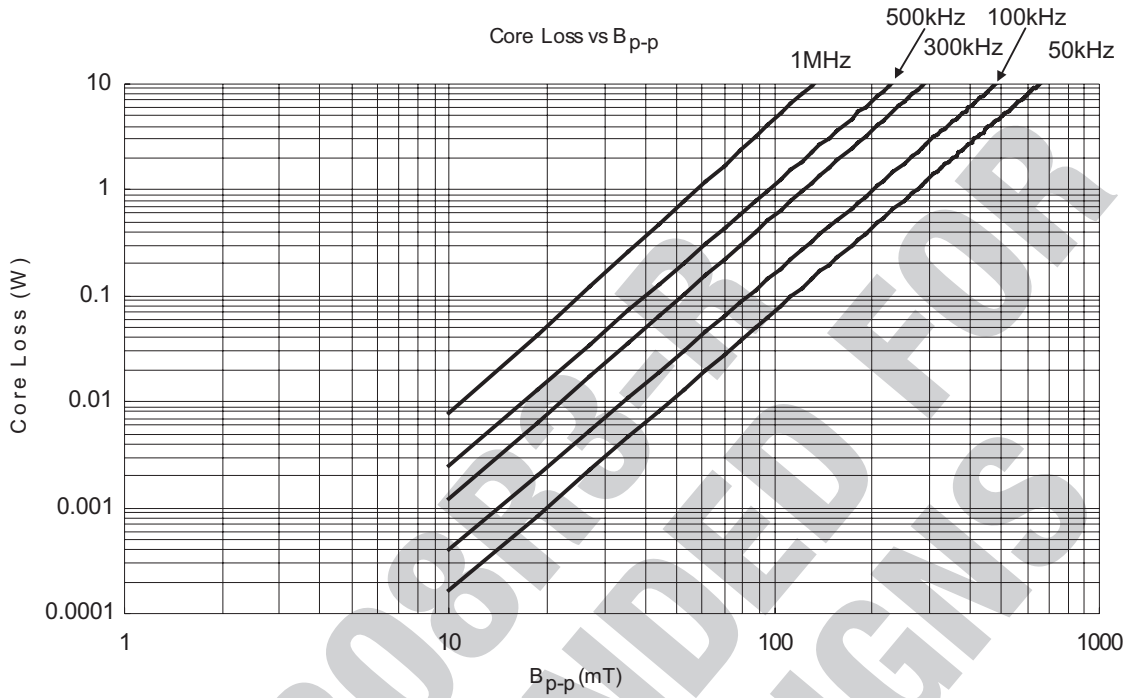


Supplied in tape-and-reel packaging, 400 parts per reel, 13" diameter reel.

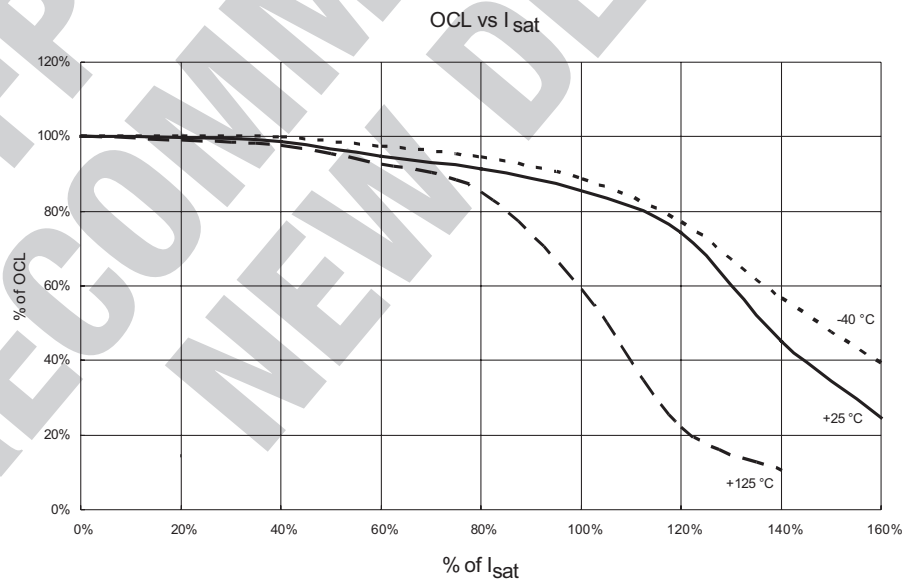
### Temperature Rise vs. Total Loss



### Core Loss



### Inductance Characteristics



## Solder Reflow Profile

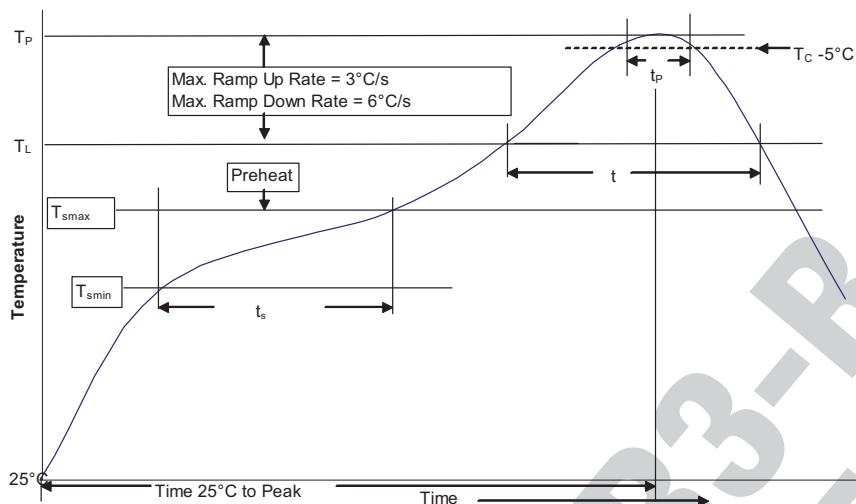


Table 1 - Standard SnPb Solder ( $T_c$ )

Package Thickness	Volume $\text{mm}^3$ <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-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 ( $T_L$ )	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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