COILTRONICS®

High Current, High Frequency, Power Inductors

FLAT-PAC™ FP1109 Series

HALOGEN HF FREE

Pb

RoHS 2002/95/EC

SMD Device

Description:

- Halogen free
- 125°C maximum total temperature operation
- 11.2 x 11.2 x 9.0mm maximum surface mount package
- Ferrite core material
- High current carrying capacity, low core losses
- Controlled DCR tolerance for sensing circuits
- Inductance range from 205nH to 950nH
- Current range from 11.5 to 69 amps
- Frequency range up to 2MHz
- RoHS compliant

Applications:

- Multi-phase regulators
- Voltage Regulator Module (VRM)
- Desktop and server VRMs and EVRDs
- Data networking and storage systems
- Graphics cards and battery power systems
- Point-of-load modules
- DCR sensing
- Notebook regulators

Environmental Data:

- Storage temperature range: -40°C to +125°C
- Operating temperature range: -40°C to +125°C (ambient plus self temperature rise)
- Solder reflow temperature: J-STD-020D compliant

Packaging:

- Supplied in tape and reel packaging, 350 parts per reel, 13" diameter reel

Product Specifications

Part Number[7]	OCL[1] ± 20% (nH)	FLL[2] Min. (nH)	I_{rms}[3] (Amps)	$I_{sat}1$[4] @ 25°C (Amps)	$I_{sat}2$[5] @ 125°C (Amps)	DCR (mΩ) @ 20°C	K-factor[6]
FP1109-R20-R	205	122	35	69	52	0.42 ±10%	233
FP1109-R23-R	247	147		55	41		233
FP1109-R27-R	270	160		51	38		233
FP1109-R33-R	311	185		44	33		233
FP1109-R47-R	463	275		27	20		233
FP1109-R58-R	548	325		22.5	17		233
FP1109-1R0-R	950	565		11.5	8.5		233

1 Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.10V_{rms}, 0.0Adc

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 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.

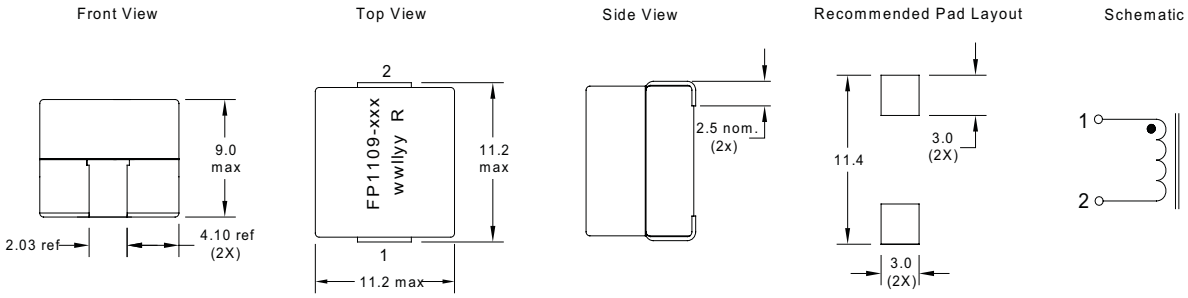
4 $I_{sat}1$: Peak current for approximately 30% rolloff at +25°C.

5 $I_{sat}2$: Peak current for approximately 30% rolloff at +125°C.

6 K-factor: Used to determine B_{p-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).

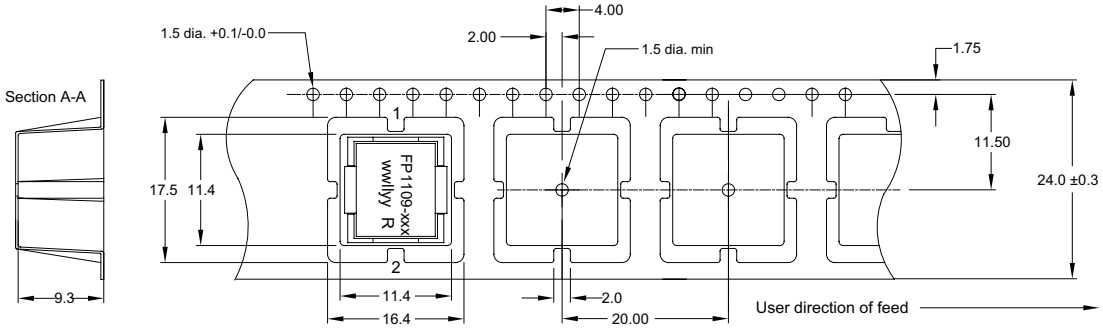
7 Part Number Definition: FP1109-xxx-R
- FP1109 = Product code and size
- xxx= Inductance value in µH, R = decimal point. If no "R" is present, then third character = # of zeros
- "-R" suffix = RoHS compliant

Dimensions - mm



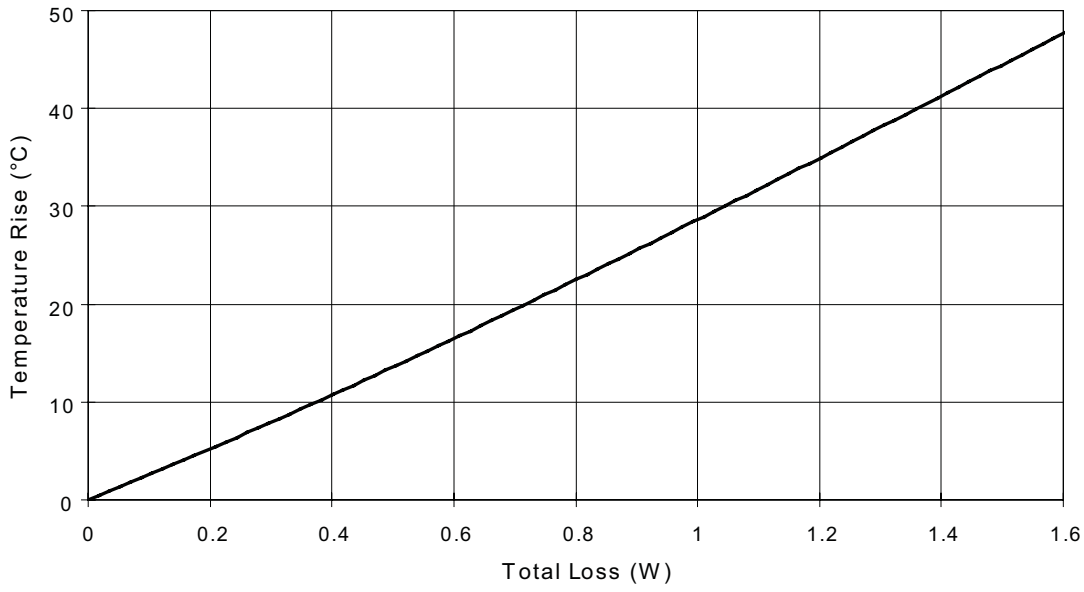
Part Marking: FP1109 xxx = Inductance value in µH. (R = Decimal point). If no "R" is present, then last character is # of zeros wwllyy = Date code R = Revision level

Packaging Information - mm

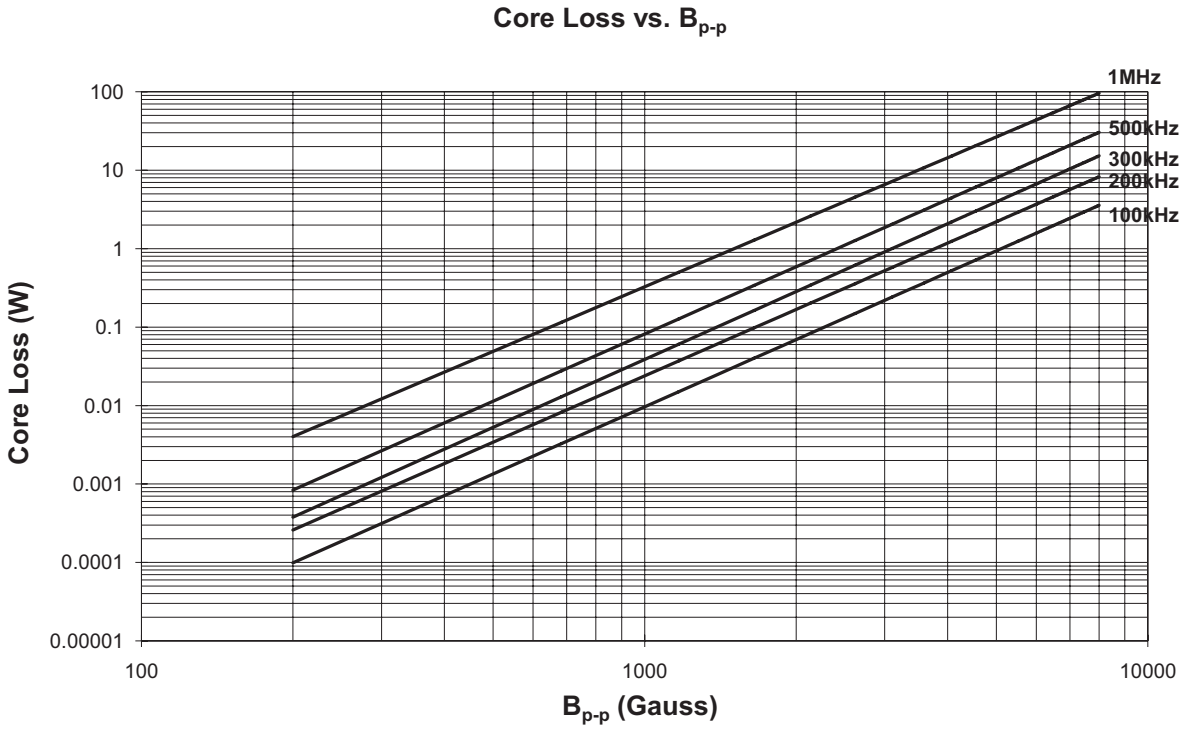


Supplied in tape-and-reel packaging, 350 parts per reel, 13" diameter reel.

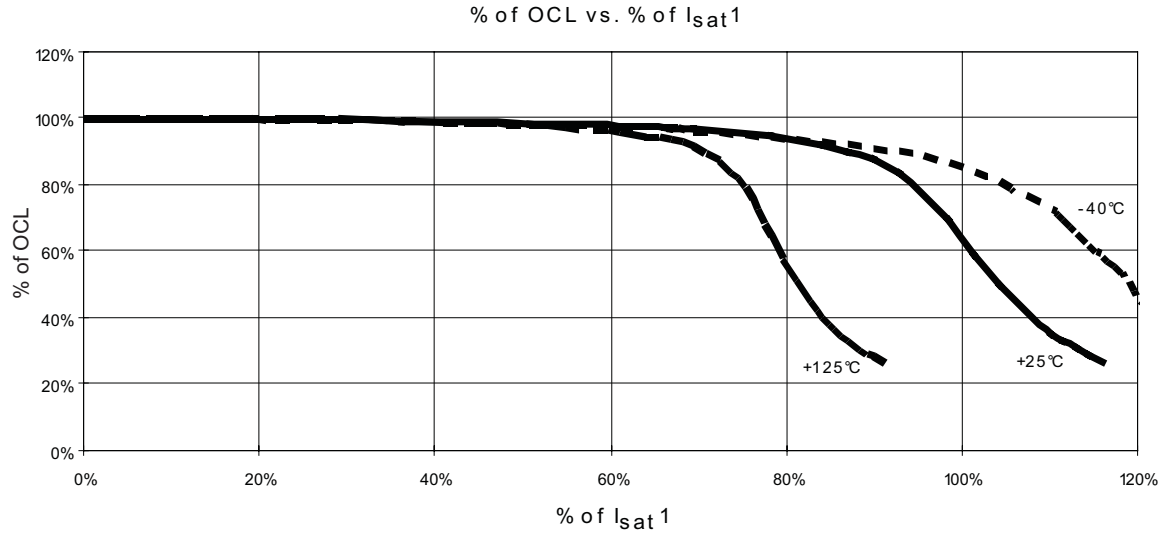
Temperature Rise vs.Total Loss



Core Loss



Inductance Characteristics



Solder Reflow Profile

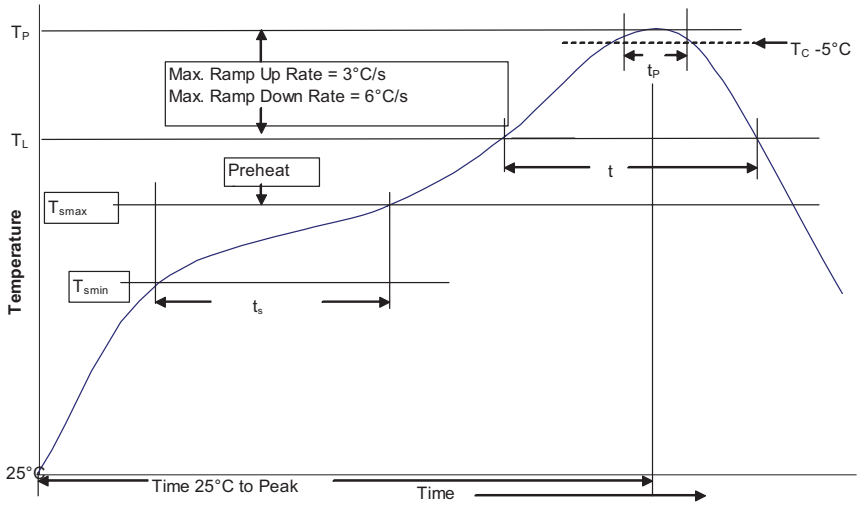


Table 1 - Standard SnPb Solder (T_C)

Package Thickness	Volume 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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