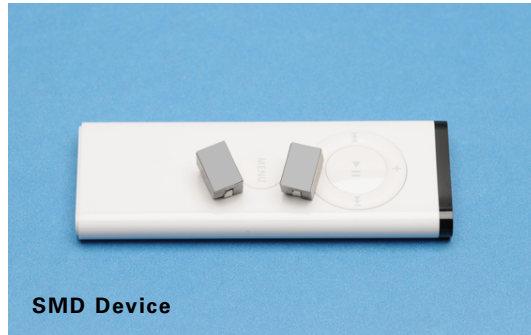


# FP1107

## High frequency, high current power inductors



SMD Device

### Product features

- 7.2 x 11.0 x 7.5mm surface mount package
- Ferrite core material
- High current carrying capacity, low core losses
- Controlled DCR tolerance for sensing circuits
- Inductance range from 70nH to 510nH
- Current range from 18 amps to 140 amps
- Frequency range up to 2MHz

### 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

### 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	OCL ± 10% (nH)	FLL <sup>2</sup> Min. (nH)	I <sub>rms</sub> <sup>3</sup> (Amps)	I <sub>sat</sub> <sup>1,4</sup> @ 25°C (Amps)	I <sub>sat</sub> <sup>2,5</sup> @ 125°C (Amps)	DCR (mΩ) @ 20°C	K-factor <sup>6</sup>
<b>R1 Version</b>							
FP1107R1-R07-R	70	50	55	140	123	0.29 ± 8%	361.1
FP1107R1-R12-R	120	86		90	72		361.1
FP1107R1-R15-R	150	108		70	56		361.1
FP1107R1-R23-R	230	166		45	36		361.1
FP1107R1-R30-R	300	217		35	28		361.1
FP1107R1-R40-R	400	288		25	20		361.1
FP1107R1-R51-R	510	364		18	14.5		361.1
<b>R2 Version</b>							
FP1107R2-R07-R	70	50	42	140	123	0.47 ± 6.4%	363.3
FP1107R2-R12-R	120	86		90	72		363.3
FP1107R2-R15-R	150	108		70	56		363.3
FP1107R2-R23-R	230	166		45	36		363.3
FP1107R2-R30-R	300	217		35	28		363.3
FP1107R2-R40-R	400	288		25	20		363.3
FP1107R2-R51-R	510	364		18	14.5		363.3

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

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

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 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<sub>sat</sub><sup>1</sup>: Peak current for approximately 20% rolloff at +25°C. 5 I<sub>sat</sub><sup>2</sup>:

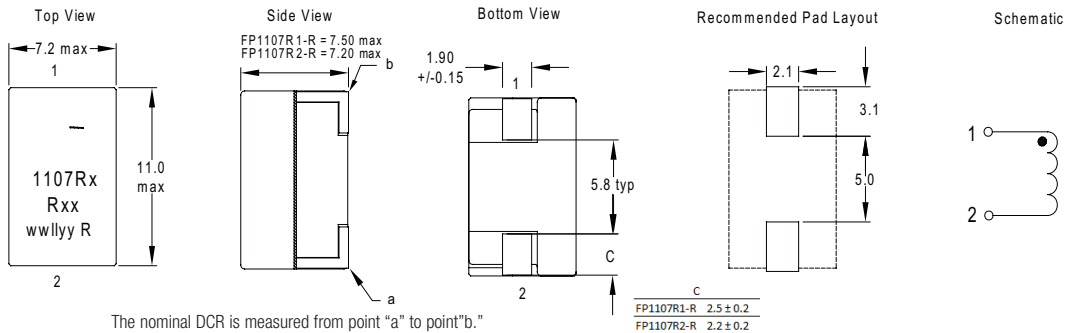
5 Peak current for approximately 20% rolloff at +125°C.

6 K-factor: Used to determine B<sub>pn</sub> for core loss (see graph). B<sub>pn</sub> = K · L · ΔI · 10<sup>-3</sup>, B<sub>pn</sub>: (Gauss), K: (K-factor from table), L: (inductance in nH), ΔI (peak-to-peak ripple current in amps).

7 Part Number Definition: FP1107Rx-Rxx-R

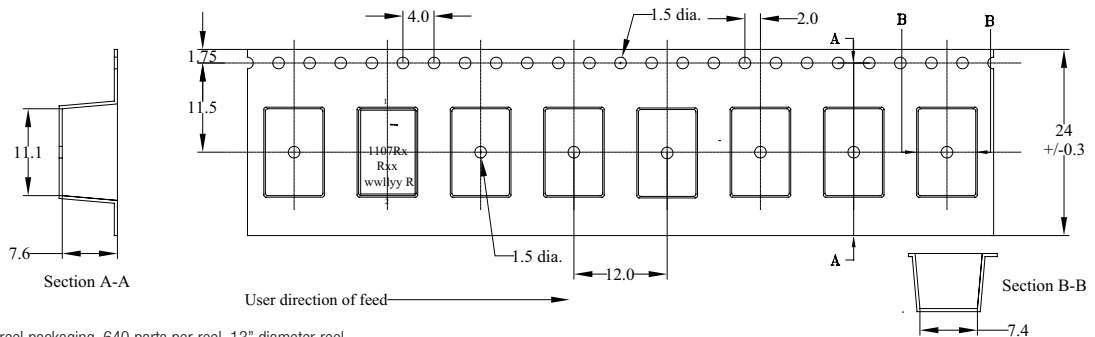
- Rx is the DCR indicator
- FP1107 = Product code and size
- Rxx= Inductance value in μH, R = decimal point
- "-R" suffix = RoHS compliant

## Dimensions- mm



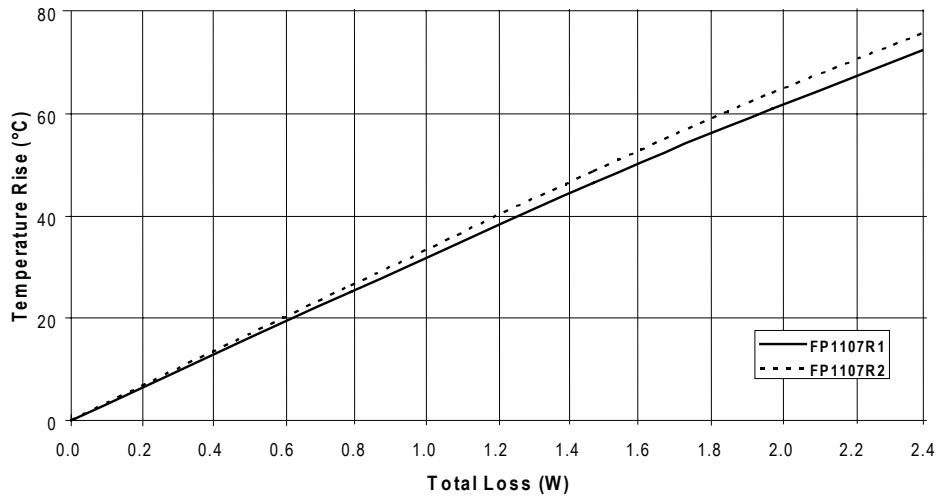
Part Marking: 1107Rx (Rx = DCR Indicator) Rxx = Inductance value in μH. (R = Decimal point) wwlyy = Date code R = Revision level

## Packaging information - mm

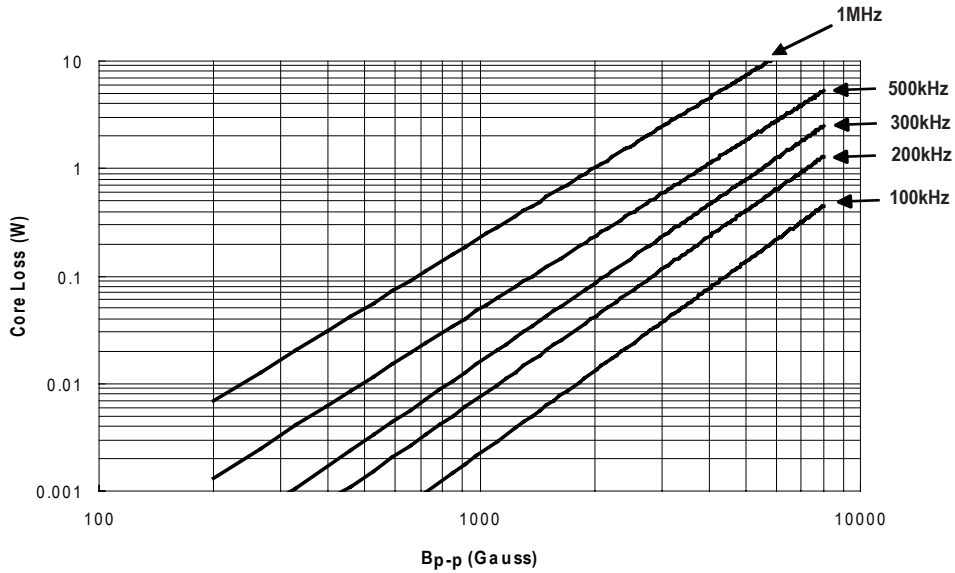


Supplied in tape-and-reel packaging, 640 parts per reel, 13" diameter reel.

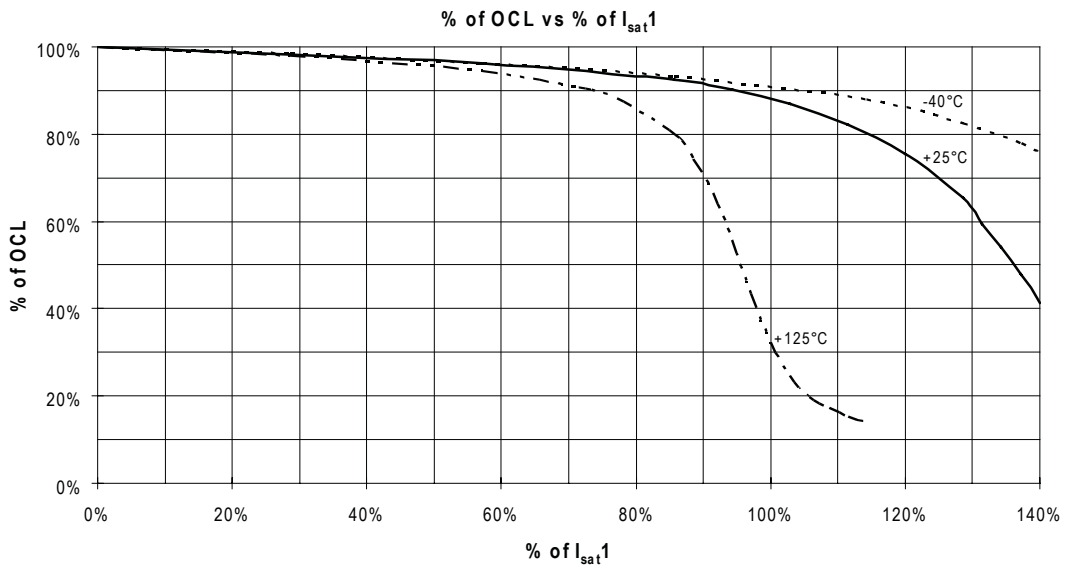
Temperature rise vs total loss



Core loss vs Bp-p



Inductance characteristics



### Solder Reflow Profile

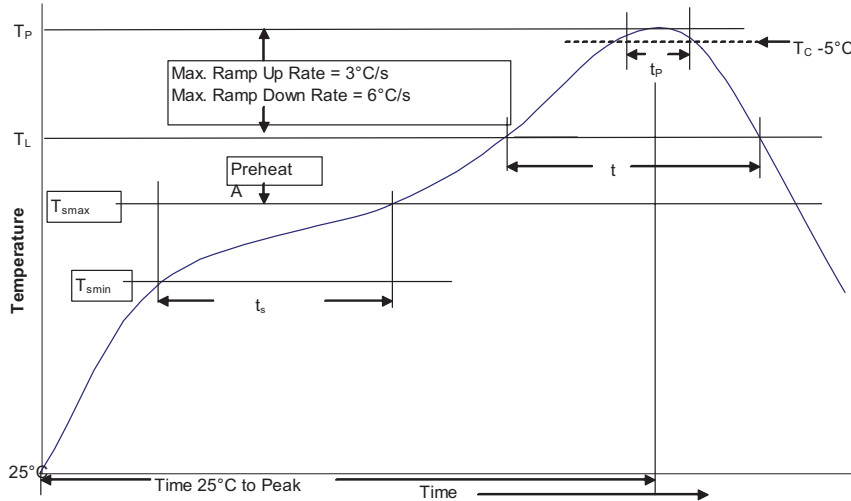


Table 1 - Standard SnPb Solder ( $T_C$ )

Package Thickness	Volume $<350$ mm <sup>3</sup>	Volume $\geq 350$ mm <sup>3</sup>
$<2.5$ mm	235°C	220°C
$\geq 2.5$ mm	220°C	220°C

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

Package Thickness	Volume $<350$ mm <sup>3</sup>	Volume $350 - 2000$ mm <sup>3</sup>	Volume $>2000$ mm <sup>3</sup>
$<1.6$ mm	260°C	260°C	260°C
1.6 – 2.5mm	260°C	250°C	245°C
$>2.5$ mm	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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