

# High Current, High Frequency, Power Inductors

## FLAT-PAC™ FP1007 Series



SMD Device

### Description:

- Halogen free
- 125°C maximum total temperature operation
- 10.4 x 8.0 x 6.5, 7.0 or 7.5mm maximum surface mount package
- Ferrite core material
- High current carrying capacity, low core losses
- Controlled DCR tolerance for sensing circuits
- Inductance range from 120nH to 300nH
- Current range from 32 to 94 Amps
- Frequency range up to 2MHz

- RoHS compliant
- Lead free

### Applications:

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

### 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 on 13" diameter reel
- FP1007R1 700 parts per reel
- FP1007R2 750 parts per reel
- FP1007R3 650 parts per reel

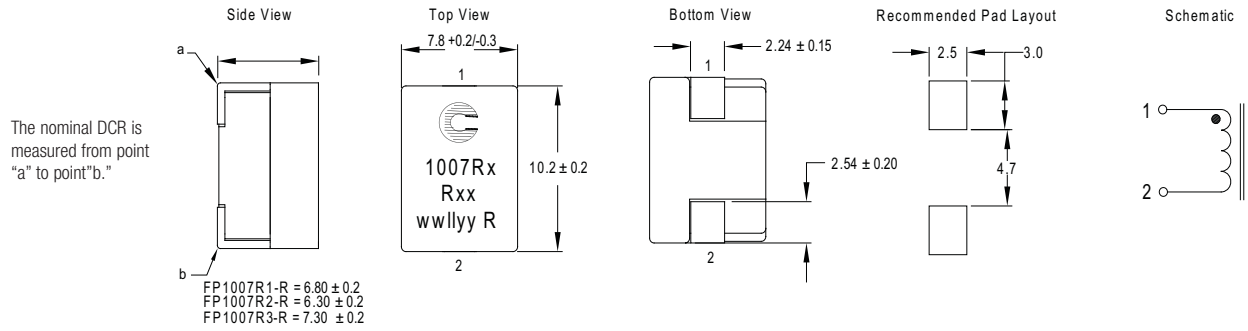
### Product Specifications

Part Number <sup>7</sup>	OCL <sup>1</sup> ± 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>
R1 Version							
FP1007R1-R12-R	120	86	60	81	65	0.29 ± 10%	371
FP1007R1-R14-R	140	100		72	56		371
FP1007R1-R17-R	170	122		58	46		371
FP1007R1-R22-R	215	155		50	36		371
FP1007R1-R30-R	300	216		32	26		371
R2 Version							
FP1007R2-R12-R	120	86	51	81	65	0.48 ± 8%	368
FP1007R2-R14-R	140	100		72	56		368
FP1007R2-R17-R	170	122		58	46		368
FP1007R2-R22-R	215	155		50	36		368
FP1007R2-R30-R	300	216		32	26		368
R3 Version							
FP1007R3-R12-R	120	86	61	94	86	0.29 ± 5%	354
FP1007R3-R15-R	150	108		76	70		354
FP1007R3-R17-R	170	122		66	60		354
FP1007R3-R22-R	215	155		50	43		354
FP1007R3-R23-R	230	165		48	40		354
FP1007R3-R27-R	270	194		40	34		354
FP1007R3-R30-R	300	216		35	30		354

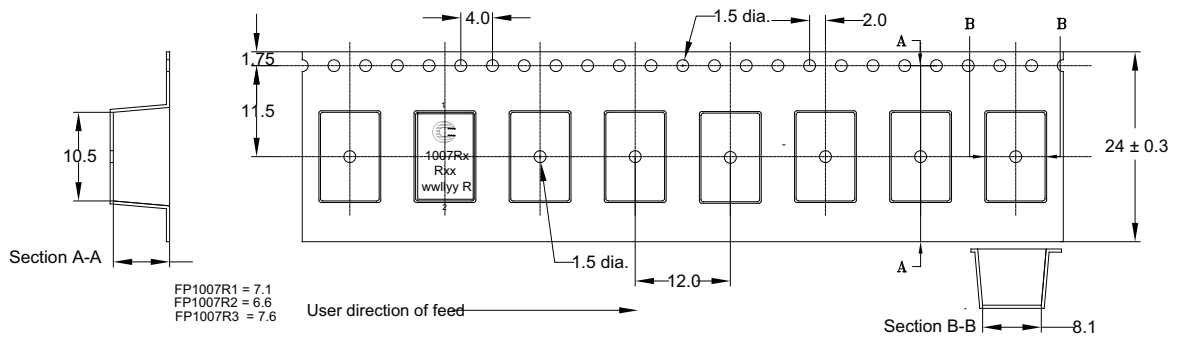
1 Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.10V<sub>rms</sub>, 0.0Aac  
 2 Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1V<sub>rms</sub>, I<sub>sat</sub><sup>1</sup>  
 3 I<sub>rms</sub>: DC current for an approximate temperature rise of 40°C without core loss. Derating is necessary 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>: Peak current for approximately 20% rolloff at +125°C.  
 6 K-factor: Used to determine B<sub>p-p</sub> for core loss (see graph). B<sub>p-p</sub> = K \* L \* ΔI \* 10<sup>-3</sup>, B<sub>p-p</sub>: (Gauss), K: (K-factor from table), L: (inductance in nH), ΔI (peak-to-peak ripple current in amps).  
 7 Part Number Definition: FP1007Rx-Rxx-R  
 • FP1007 = Product code and size  
 • Rx is the DCR indicator  
 • Rxx= Inductance value in μH, R = decimal point  
 • "-R" suffix = RoHS compliant

### Dimensions - mm

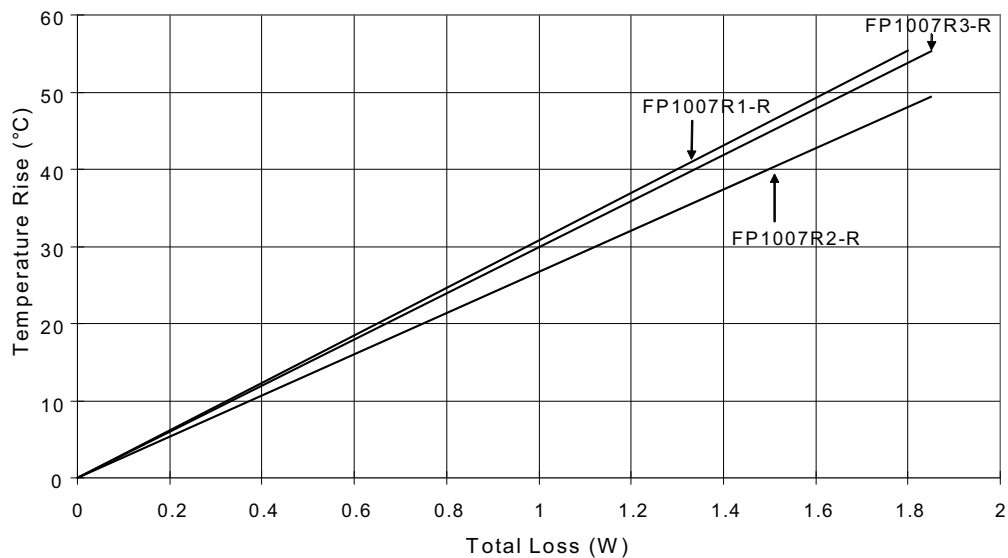


### Packaging Information - mm

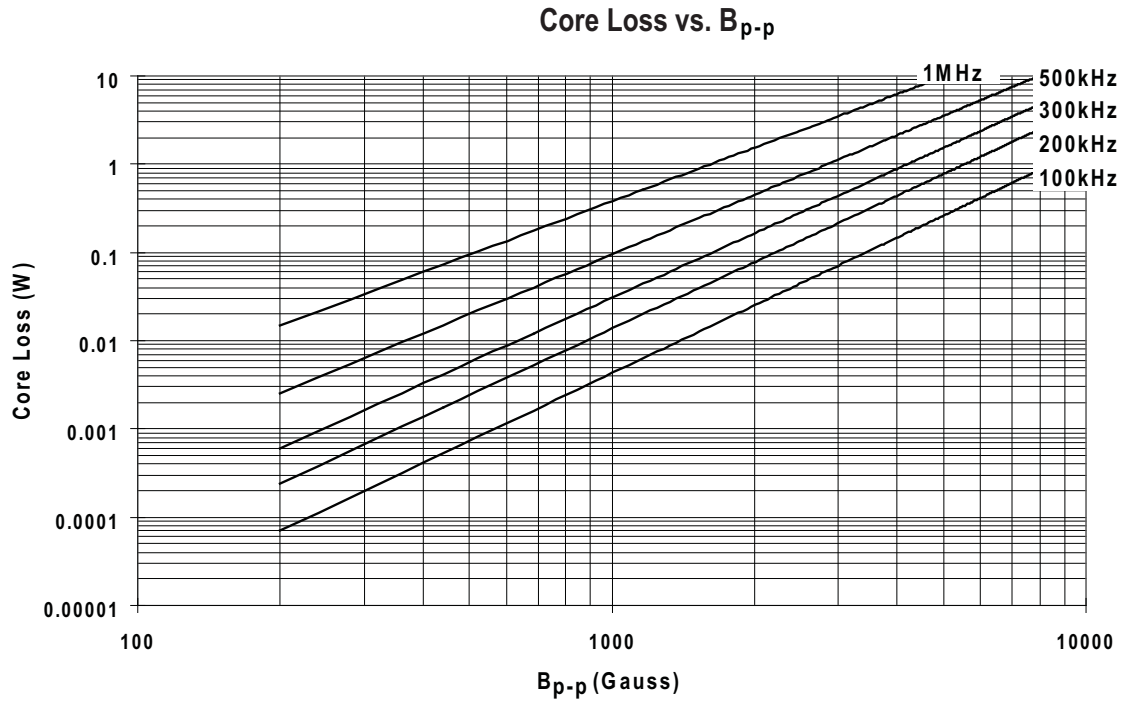


Supplied in tape-and-reel packaging, on 13" diameter reel; FP1007R1 700 parts, FP1007R2 750 parts, FP1007R3 650 parts

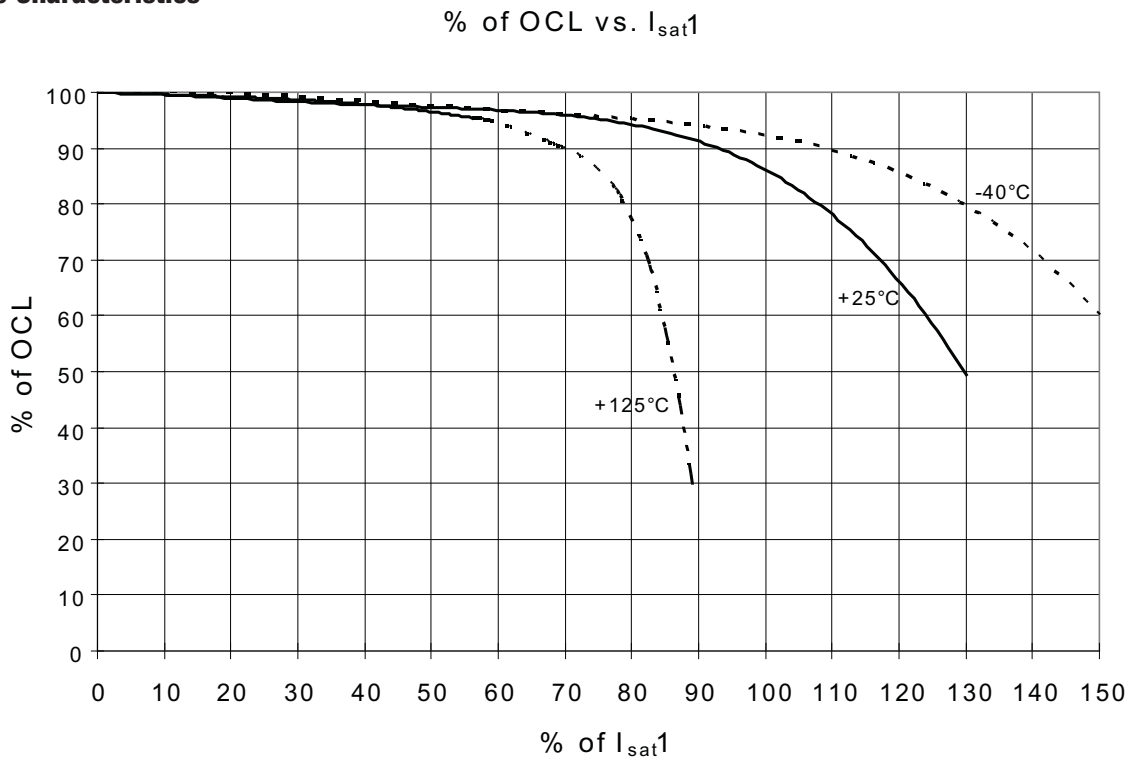
### Temperature Rise vs.Total Loss



### Core Loss



### Inductance Characteristics



## Solder Reflow Profile

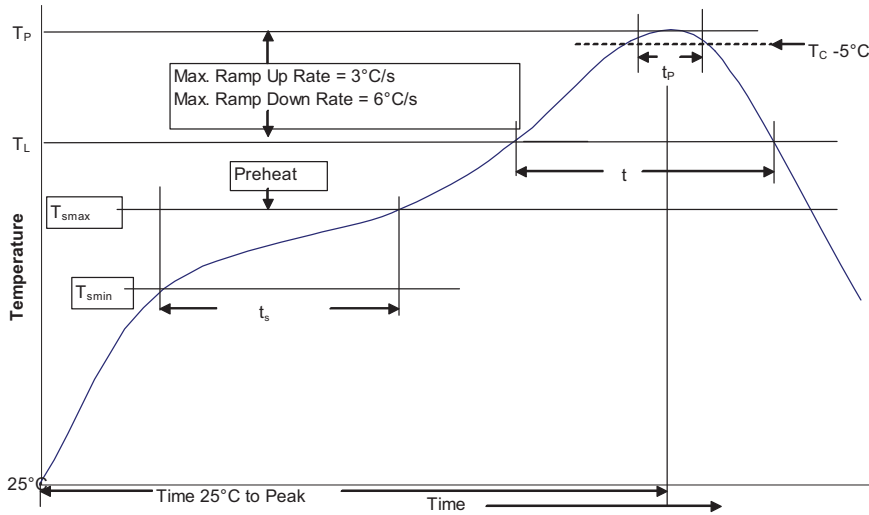


Table 1 - Standard SnPb Solder ( $T_C$ )

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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