

# FP1007R6

## High frequency, high current power inductors



**SMD Device**

### Product features

- 10.5 x 8.0 x 7.0mm Maximum surface mount package
- Ferrite core material
- Controlled DCR tolerance for sensing circuits
- Inductance Range from 150nH to 470nH
- Current range from 23.5 to 75 Amps
- Frequency range up to 2MHz
- 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

### 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

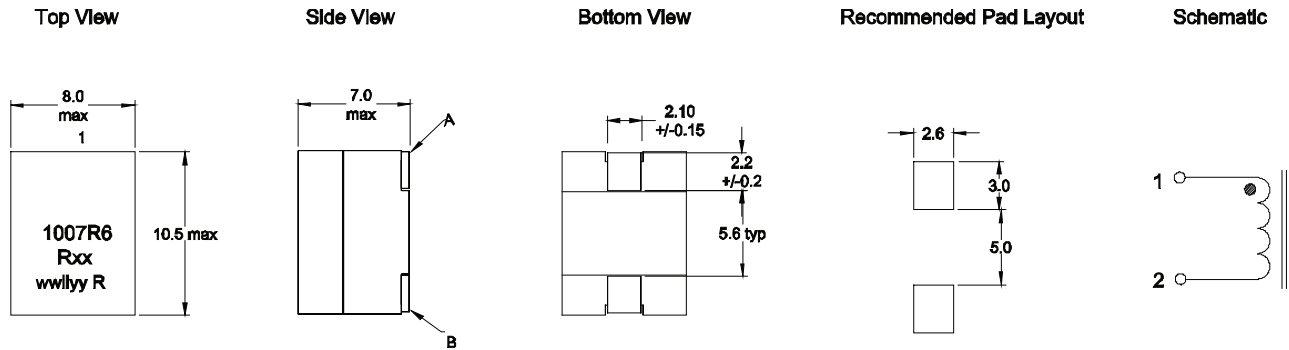


Product Specifications							
Part Number <sup>7</sup>	OCL <sup>1</sup> ±10% (nH)	FLL <sup>2</sup> Min. (nH)	<i>I</i> <sub>rms</sub> <sup>3</sup> (Amps)	<i>I</i> <sub>sat</sub> 1 <sup>4</sup> @25°C (Amps)	<i>I</i> <sub>sat</sub> 2 <sup>5</sup> @100°C (Amps)	DCR @20°C (mΩ)	K-Factor <sup>6</sup>
FP1007R6-R15-R	150	108	61	75.0	60.0	0.29 ± 5%	348.8
FP1007R6-R18-R	180	129		60.0	50.0		
FP1007R6-R22-R	220	158		50.0	40.0		
FP1007R6-R27-R	270	194		41.0	33.0		
FP1007R6-R33-R	330	237		33.0	26.5		
FP1007R6-R39-R	390	280		28.0	22.5		
FP1007R6-R47-R	470	338		23.5	19.0		

- Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.10V<sub>rms</sub>, 0.0A<sub>dc</sub>
- Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1V<sub>rms</sub>, *I*<sub>sat</sub>1
- 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.
- I*<sub>sat</sub>1: Peak current for approximately 20% rolloff at +25°C.

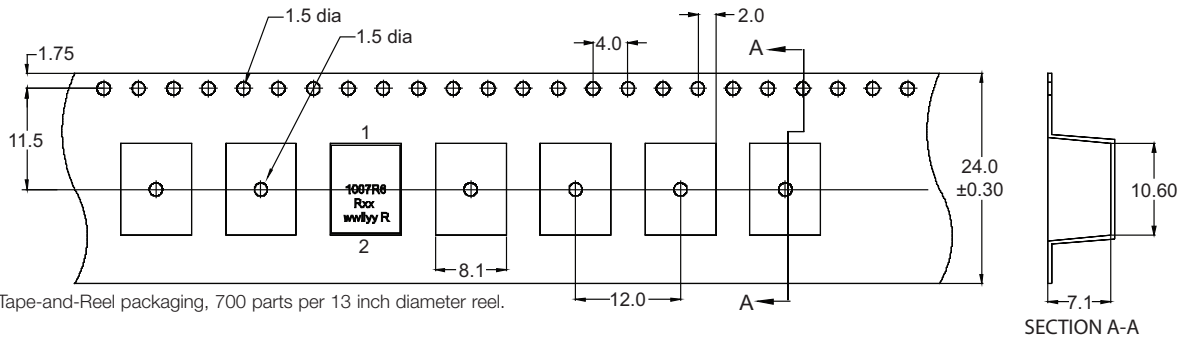
- I*<sub>sat</sub>2: Peak current for approximately 20% rolloff at +100°C.
- K-factor: Used to determine B<sub>p-p</sub> for core loss (see graph). B<sub>p-p</sub> = K \* L \* Δ*I* \* 10<sup>-3</sup>. B<sub>p-p</sub>:(Gauss), K: (K-factor from table), L: (Inductance in nH), Δ*I* (peak-to-peak ripple current in Amps).
- Part Number Definition: FP1007R6-Rxx-R  
 FP1007R6 = Product code and size  
 Rxx= Inductance value in uH, R = decimal point  
 -R suffix = RoHS compliant

**Dimensions- mm**



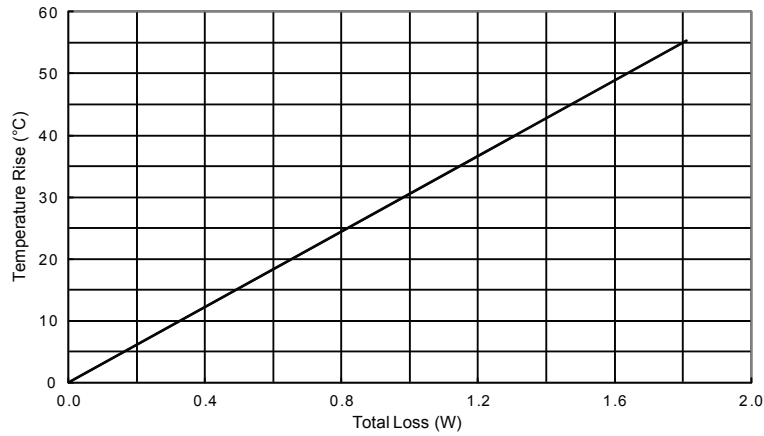
The nominal DCR is measured from point "A" to point "B"  
 Part Marking: 1007R6, Rxx = Inductance value in μH. (R = Decimal point) wwllly = Date code R = Revision level Tolerance are ±0.15mm unless otherwise specified.  
 Soldering surfaces to be coplanar within 0.1016mm.  
 PCB tolerance ±0.1mm unless otherwise specified.

**Packaging information - mm**

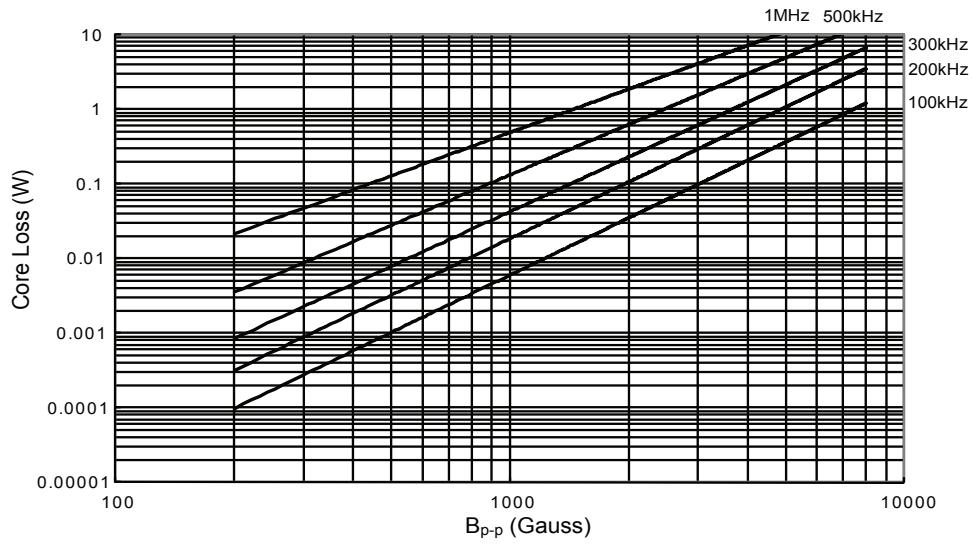


Supplied in Tape-and-Reel packaging, 700 parts per 13 inch diameter reel.

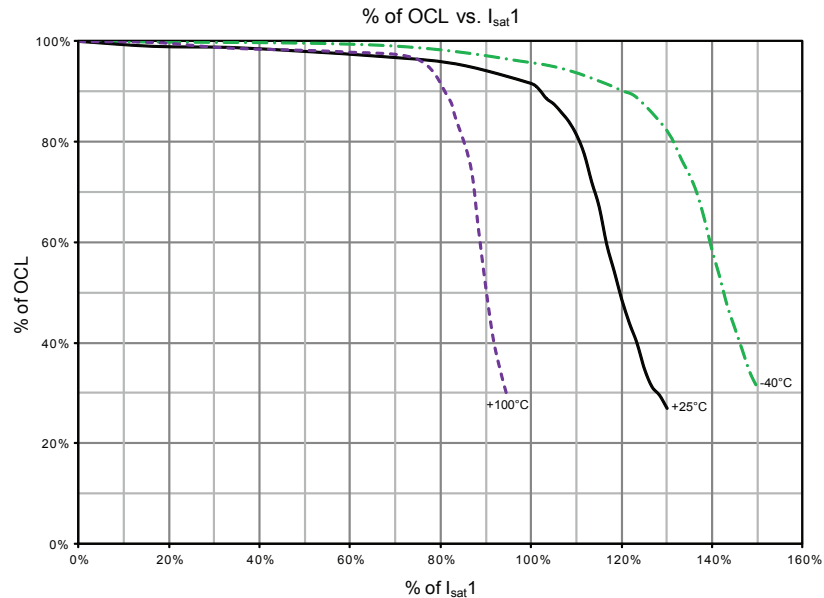
**Temperature rise vs total loss**



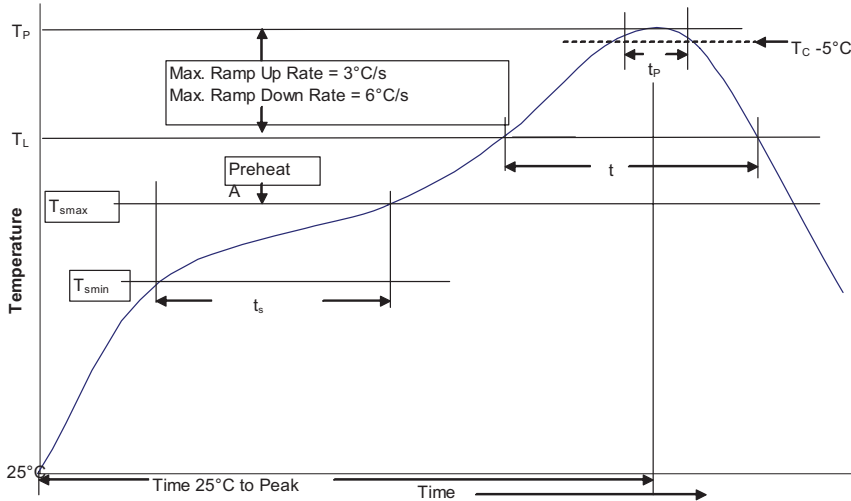
**Core loss vs Bp-p**



**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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**Eaton**  
Electronics Division  
1000 Eaton Boulevard  
Cleveland, OH 44122  
United States  
www.eaton.com/electronics

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#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.