

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

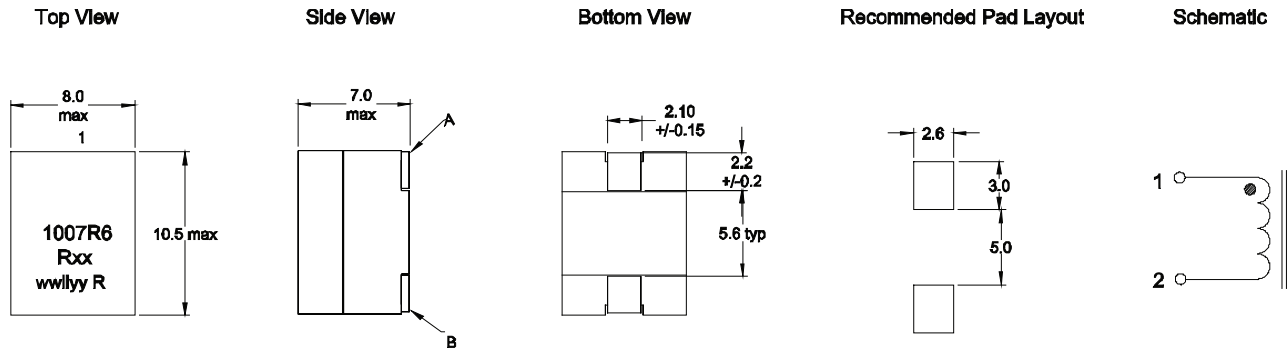


| Product Specifications | | | | | | | |
|--------------------------|----------------------------|----------------------------|--------------------------------------|--|---|----------------|-----------------------|
| Part Number ⁷ | OCL ¹ ±10% (nH) | FLL ² Min. (nH) | I _{rms} ³ (Amps) | I _{sat} 1 ⁴ @25°C (Amps) | I _{sat} 2 ⁵ @100°C (Amps) | DCR @20°C (mΩ) | K-Factor ⁶ |
| 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_{rms}, 0.0A_{dc}
- Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1V_{rms}, I_{sat}1
- I_{rms}: 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_{sat}1: Peak current for approximately 20% rolloff at +25°C.

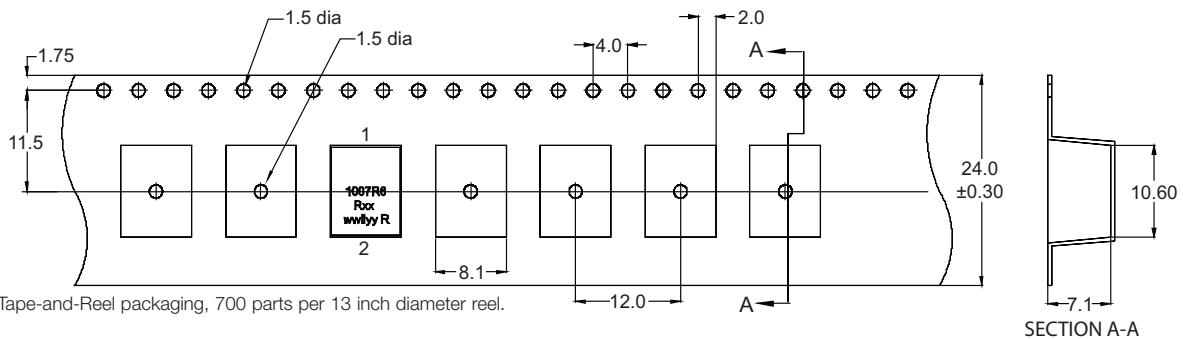
- I_{sat}2: Peak current for approximately 20% rolloff at +100°C.
- K-factor: Used to determine B_{p-p} for core loss (see graph). B_{p-p} = K * L * ΔI * 10⁻³. B_{p-p}:(Gauss), K: (K-factor from table), L: (Inductance in nH), ΔI (peak-to-peak ripple current in Amps).
- Part Number Definition: FP1007R6-Rxx-R
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) wwlyy = 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_p)

| Package Thickness | Volume mm^3 <350 | Volume mm^3 ≥ 350 |
|---------------------|---------------------------|---------------------------------|
| <2.5mm | 235°C | 220°C |
| $\geq 2.5\text{mm}$ | 220°C | 220°C |

Table 2 - Lead (Pb) Free Solder (T_p)

| Package Thickness | Volume mm^3 <350 | Volume mm^3 350 - 2000 | Volume 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.

Life Support Policy: Eaton does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

Eaton reserves the right, without notice, to change design or construction of any products and to discontinue or limit distribution of any products. Eaton also reserves the right to change or update, without notice, any technical information contained in this bulletin.

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

© 2017 Eaton
All Rights Reserved
Printed in USA
Publication No. 10007 BU-SB12795
June 2017