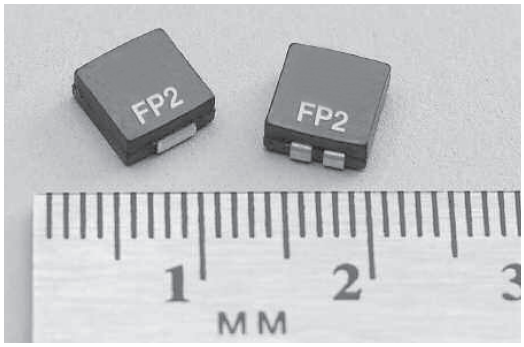
# FP2

## Low profile, high current power inductors




### Product description

- High current carrying capacity
- Dual conductors allow for low inductance and high current or high inductance and lower current
- Inductance range from 0.047uH to 0.480uH
- Current range 9.0 to 42 Amps
- 7.2 x 6.7mm footprint surface mount package in a 3.0 or 5.0mm heights
- Ferrite core material
- Halogen free, lead free, RoHS compliant

### Applications

- Servers
- Multi-phase and Vcore regulators
- Voltage Regulator Modules (VRMs)
  - Server and desktop
  - Central processing unit (CPU)
  - Graphics processing unit (GPU)
  - Application specific integrated circuit (ASIC)
  - High power density
- Notebook regulators
- Battery power systems
- Graphics cards

### 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-020D compliant

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## Product specifications

| Part number[5] | OCL[1] (µH) ±15% | $I_{rms}$[2] (amps) | $I_{sat}$[3] (amps) | DCR (Ω) typical @ 20°C | Height maximum | Volt-µsec[4] (V-µs) |
|---|---|---|---|---|---|---|
| Single conductor | | | | | | |
| FP2-S047-R | 0.047 | 39 | 42 | 0.00024 | 3 | 0.75 |
| FP2-S068-R | 0.068 | 39 | 32 | 0.00024 | 3 | 0.75 |
| FP2-S082-R | 0.082 | 39 | 26 | 0.00024 | 3 | 0.75 |
| FP2-S100-R | 0.100 | 39 | 22 | 0.00024 | 3 | 0.75 |
| FP2-S120-R | 0.120 | 39 | 18 | 0.00024 | 3 | 0.75 |
| FP2-S200-R | 0.200 | 37 | 19 | 0.00028 | 5 | 0.99 |
| FP2-V050-R | 0.050 | 37 | 70 | 0.00028 | 5 | 0.99 |
| FP2-V100-R | 0.100 | 37 | 40 | 0.00028 | 5 | 0.99 |
| FP2-V120-R | 0.120 | 37 | 33 | 0.00028 | 5 | 0.99 |
| FP2-V150-R | 0.150 | 37 | 25.5 | 0.00028 | 5 | 0.99 |
| Double conductor | | | | | | |
| FP2-D047-R | 0.047 | 37 | 42 | 0.00026 | 3 | 0.75 |
| FP2-D068-R | 0.068 | 37 | 32 | 0.00026 | 3 | 0.75 |
| FP2-D082-R | 0.082 | 37 | 26 | 0.00026 | 3 | 0.75 |
| FP2-D100-R | 0.100 | 37 | 22 | 0.00026 | 3 | 0.75 |
| FP2-D120-R | 0.120 | 37 | 18 | 0.00026 | 3 | 0.75 |

## Series mode

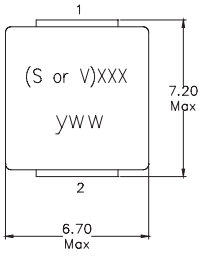
| Part number[5] | OCL[1] (µH) ±15% | $I_{rms}$[2] (amps) | $I_{sat}$[3] (amps) | DCR (Ω) typical @ 20°C | Height maximum | Volt-µsec[4] (V-µs) |
|---|---|---|---|---|---|---|
| Double conductor | | | | | | |
| FP2-D047-R | 0.188 | 16 | 21 | 0.0013 | 3 | 1.5 |
| FP2-D068-R | 0.272 | 16 | 16 | 0.0013 | 3 | 1.5 |
| FP2-D082-R | 0.328 | 16 | 13 | 0.0013 | 3 | 1.5 |
| FP2-D100-R | 0.400 | 16 | 11 | 0.0013 | 3 | 1.5 |
| FP2-D120-R | 0.480 | 16 | 9 | 0.0013 | 3 | 1.5 |

1. Open Circuit Inductance (OCL) Test parameters: 1.0MHz, 0.25Vrms, ).0Adc, +25°C
2. Irms: 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, airflow, 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.
3. Isat : Peak current for approximately 30% rolloff @ +20°C.
4. Applied Volt-Time product (V-µs) across the inductor. This value represents the applied V-µs at 500kHz necessary to generate a core loss equal to 10% of the total losses for 40°C temperature rise.
5. Part Number Definition: FP2-xyyy-R
   FP2 = Product code and size
   x = Version indicator, S = single conductor, V = single conductor, D = dual conductor
   yyy = Inductance value in uH, R = decimal point
   -R suffix = RoHS compliant

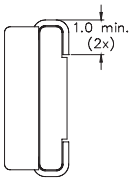
## Dimensions–mm

Single conductor

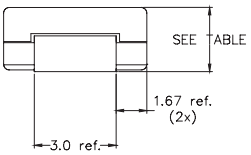
Top View



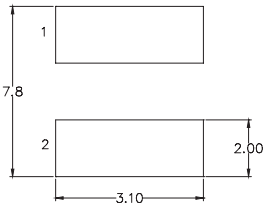

Side View



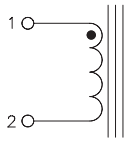

Front View




Recommended Pad Layout




Schematic

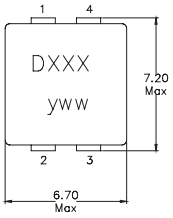



Table

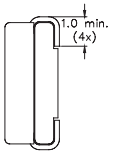
| Part Number | Max Ht. |
|---|---|
| FP2–S047<br>FP2–S068<br>FP2–S082<br>FP2–S100<br>FP2–S120 | 3.00 |
| | |
| FP2–S200 FP2–V050<br>FP2–V100 FP2–V120<br>FP2–V150 | 5.0 |

Dual conductor

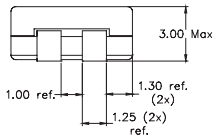
Top View



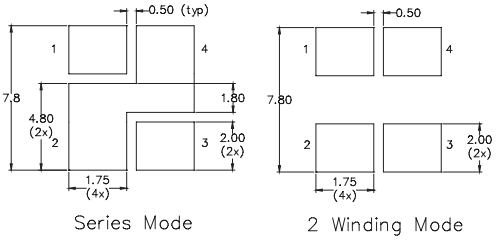

Side View




Front View




Recommended Pad Layout

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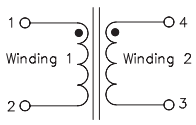
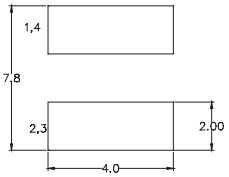



Parallel Mode

Part marking: FPS, V or D (S= single conductor, V= single conductor, D= dual conductor),

xxx (xxx= inductance value in uH, R= decimal point)

yww= date code

Tolerances are ±0.2 millimeters unless stated otherwise

All soldering surfaces to be coplanar within 0.15 millimeters

Do not route traces or vias underneath the inductor

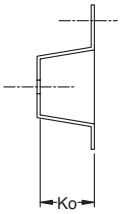
## Packaging information

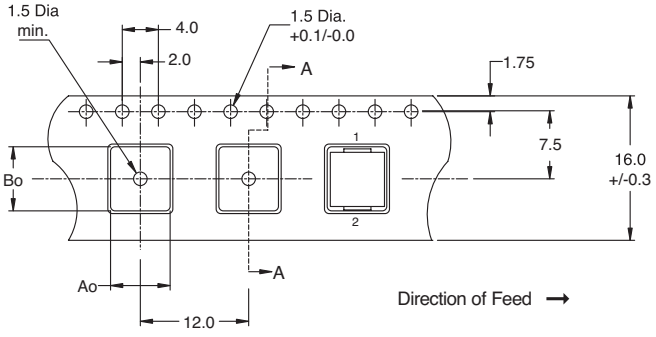
Supplied in tape and reel packaging.

FP2-S,FP2-D: 1,700 parts per 13" diameter reel.

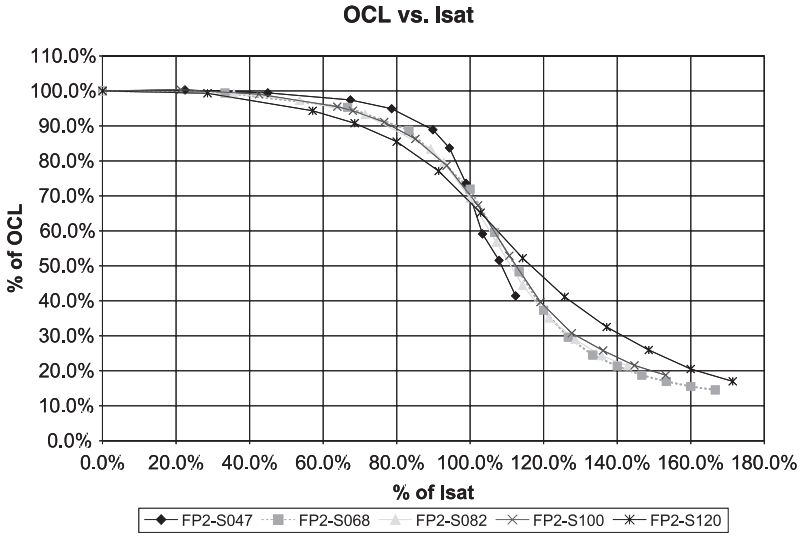
FP2-S200, FP2-V: 950 parts per 13" diameter reel.

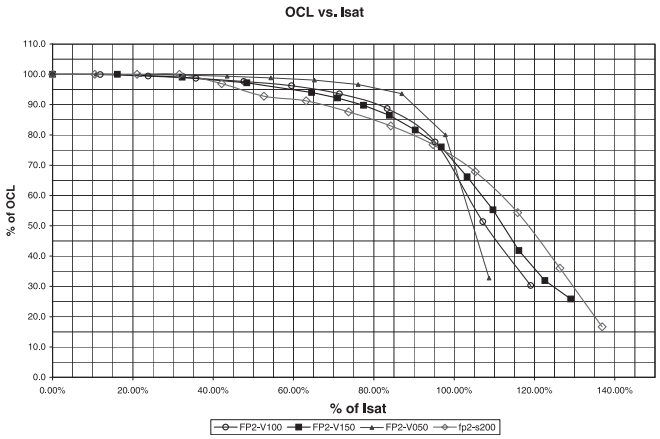
Ao=6.6mm
Bo=7.1mm
Ko=3.2mm
(FP2-S,FP2-D)
Ko=5.2mm
(FP2-S200,FP2-V)

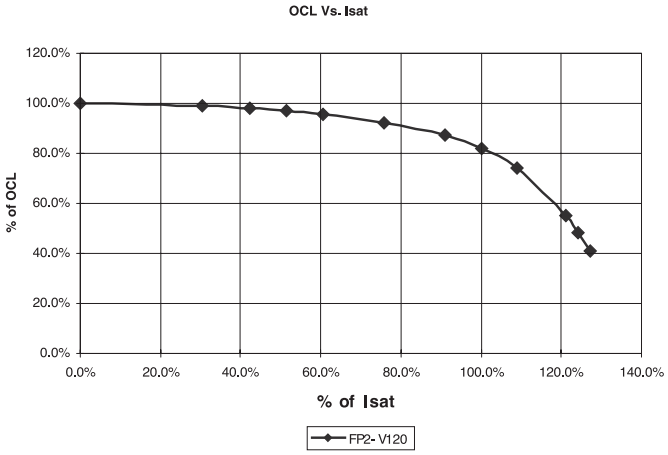


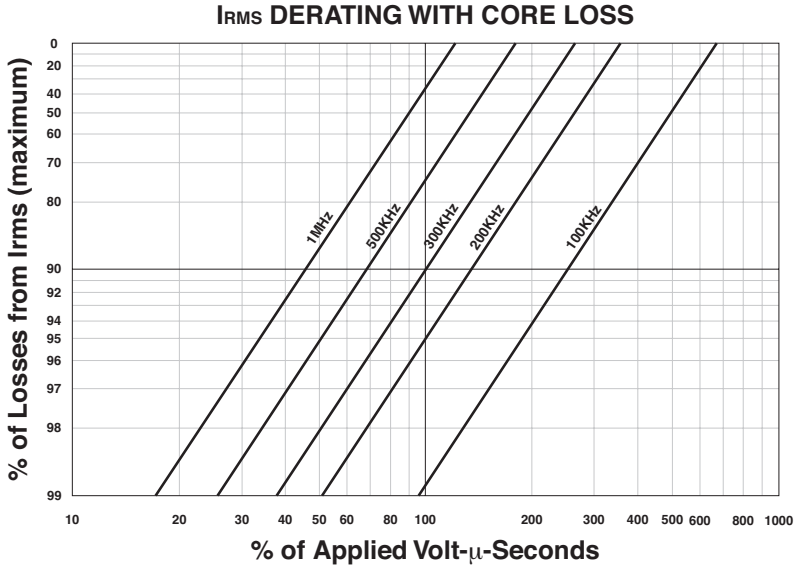
**Inductance characteristics**




Core loss



## Solder reflow profile

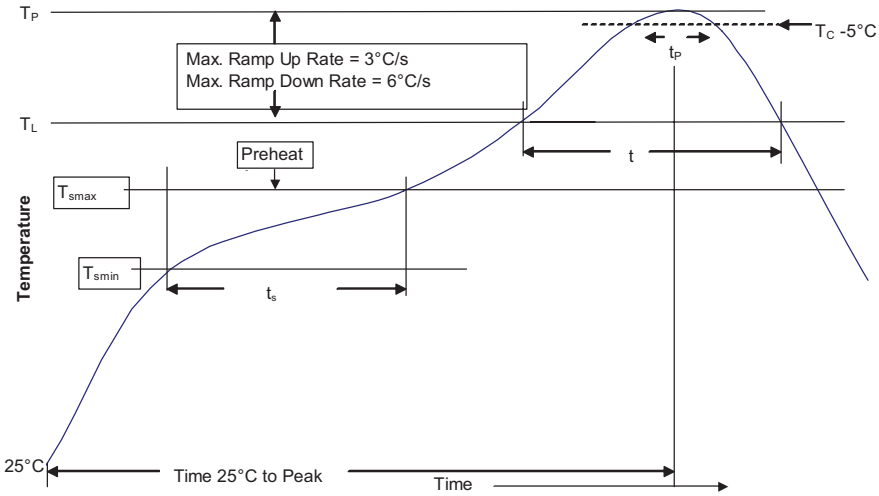



**Table 1 - Standard SnPb Solder ($T_C$)**

| 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 ($T_L$)<br>Time at liquidous ($t_L$) | | 183°C<br>60-150 Seconds | 217°C<br>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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Powering Business Worldwide

Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
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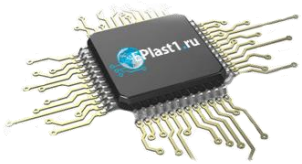
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.




**Как с нами связаться**

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