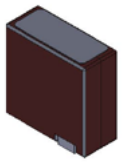
FP1010V11

High frequency, high current power inductors



Product features

- Vertical design utilizes less board space
- High current carrying capacity
- Operating frequency up to 3 MHz
- Inductance range from 70 nH to 90 nH
- Current range 61 A to 130 A
- 10.0 mm x 4.5 mm footprint surface mount package in 10 mm height
- Moisture sensitivity level (MSL): 1
- Ferrite core material

Applications

- Multi-phase and Vcore regulators
- Voltage regulator modules (VRMs) and high power density VRMs
  - Server and desktop
  - Central processing unit (CPU)
  - Graphics processing unit (GPU)
  - Application specific integrated circuit (ASIC)
- Data networking and storage systems
- Graphics cards and battery power systems
- Point-of-Load modules

Environmental compliance and general specifications

- 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

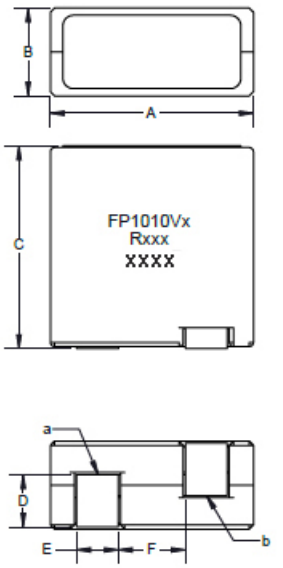
Powering Business Worldwide

Product specifications

Part number[8]	OCL[1] (nH) ±10%	FLL[2] (nH) minimum	I_{rms}[3] (A)	$I_{sat}1$[4] (A)	$I_{sat}2$[5] (A)	$I_{sat}3$[6] (A)	DCR (mΩ) @ +20 °C maximum	K-factor[7]
FP1010V11-R070-R	70	50	61	130+	115	108	0.2	460
FP1010V11-R090-R	90	64	61	105	90	84	0.2	460

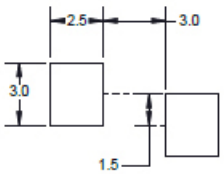
1. Open circuit inductance (OCL) test parameters: 100 kHz, 0.1 Vrms, 0.0 Adc, +25 °C
2. Full load inductance (FLL) test parameters: 100 kHz, 0.1 Vrms, $I_{sat}1$, +25 °C
3. I_{rms}: DC current for an approximate temperature rise of 40 °C without core loss. Derating is necessary for AC currents. PCB layout, 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.
4. $I_{sat}1$: Peak current for approximately 20% rolloff @ +25 °C
5. $I_{sat}2$: Peak current for approximately 20% rolloff @ +100 °C
6. $I_{sat}3$: Peak current for approximately 20% rolloff @ +125 °C
7. K-factor: Used to determine Bp-p for core loss (see graph). Bp-p = K * L * ΔI * 10^{-3}. Bp-p:(Gauss), K: (K-factor from table), L: (Inductance in nH), ΔI (Peak to peak ripple current in Amps).
8. Part number definition: FP1010Vx-Rxxx-R
   FP1010 = Product code and size
   Vx= Version indicator
   Rxxx=Inductance value in µH, R=decimal point
   -R suffix = RoHS compliant

Dimensions-mm

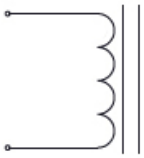


Dimension	FP1010V11
A	10 maximum
B	4.5 maximum
C	10 maximum
D	2.5 reference
E	2.0 reference
F	3.2 reference

Recommended pad layout



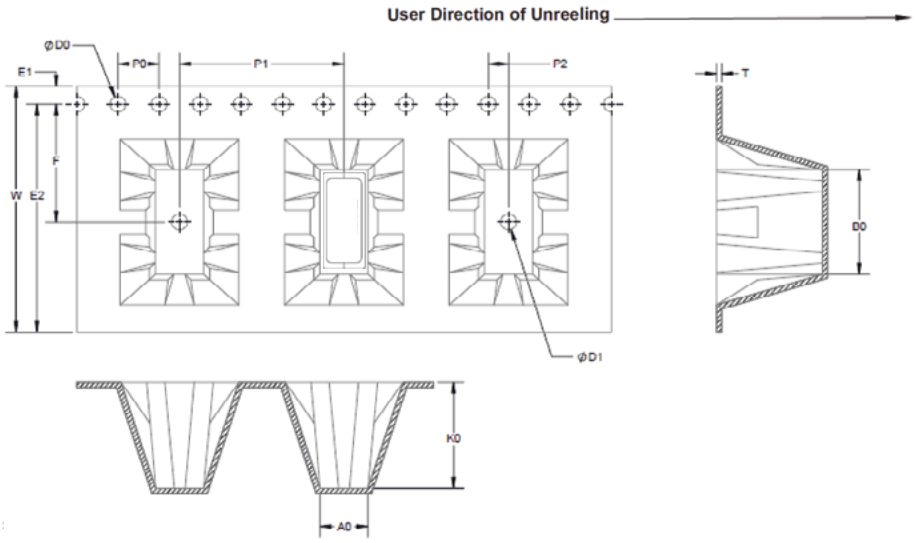
Schematic



Part marking: FP1010=Product code and size, Vx=Version indicator, Rxxx= inductance value in uH, R=decimal point, xxxx= lot code
Tolerances are ±0.15 millimeters unless stated otherwise
All soldering surfaces to be coplanar within 0.1 millimeters
Pad layout tolerances are ±0.1 millimeters unless stated otherwise
DCR is measured from point "a" to point "b"
Traces or vias underneath the inductor is not recommended

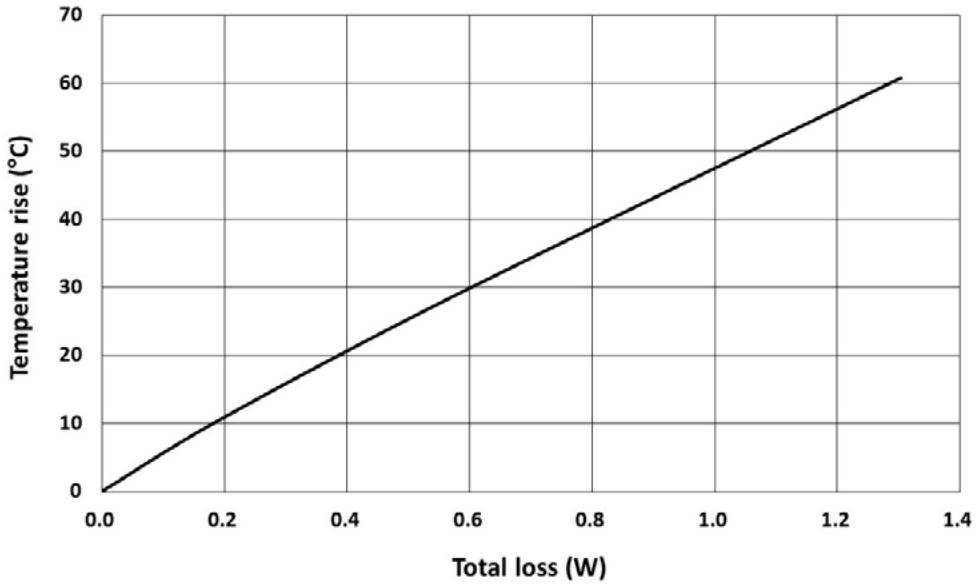
Packaging information- mm

Supplied in tape and reel packaging, 350 parts per 13" diameter reel (EIA-481 compliant)

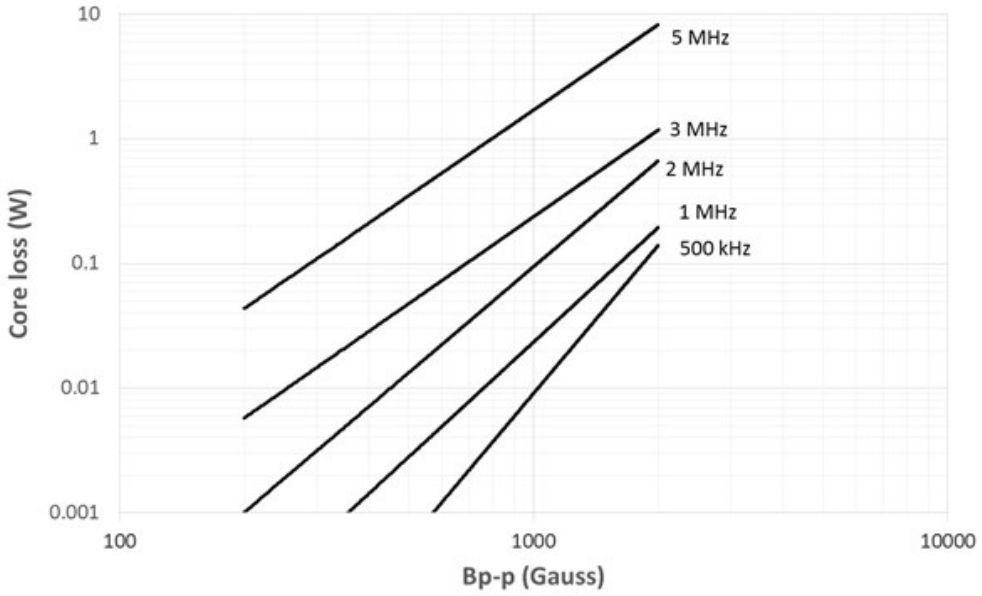


W ±0.3	24.00
F±0.1	11.50
E1±0.10	1.75
E2 min	22.25
P0±0.10	4.00
P1±0.10	16.00
P2±0.1	2.00
D0+0.10/-0	1.50
D1+min	1.50
A0	4.65±0.10
B0	10.15±0.10
K0	10.3±0.10
T ±0.05	0.5

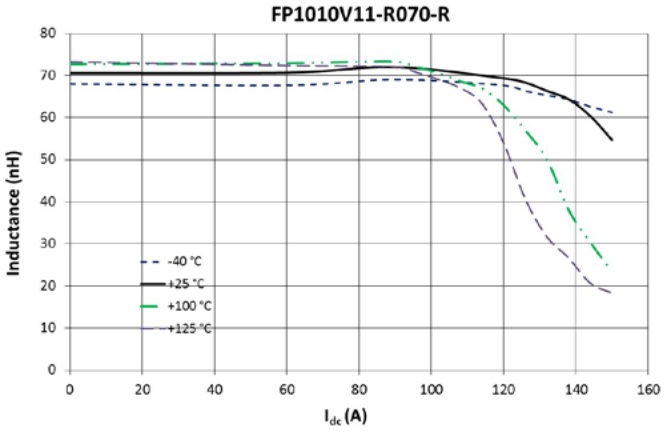
Temperature rise vs. total loss

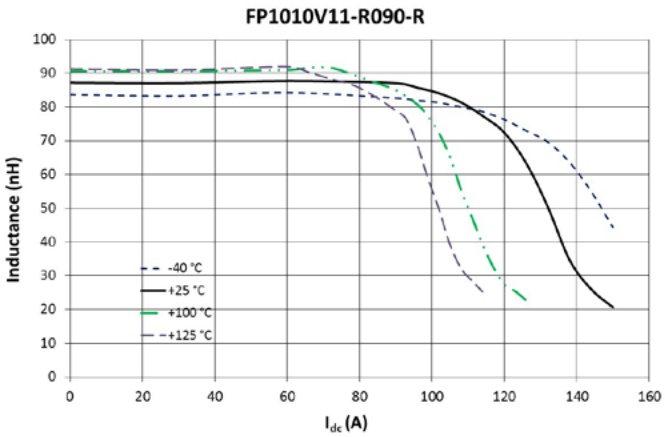


Core loss vs Bp-p



Inductance characteristics





Solder reflow profile

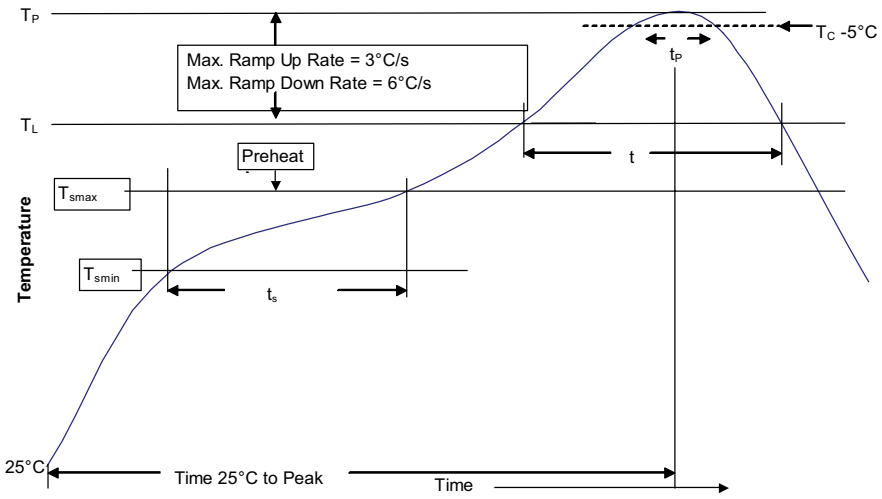


Table 1 - Standard SnPb solder (T_C)

Package thickness	Volume mm3 <350	Volume mm3 ≥350
<2.5 mm)	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2 - Lead (Pb) free solder (T_C)

Package thickness	Volume mm³ <350	Volume mm³ 350 - 2000	Volume mm³ >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Reference J-STD-020

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
Ramp up rate T_L to T_p		3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L		183 °C 60-150 seconds	217 °C 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*
Ramp-down rate (T_p to T_L)		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.

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