FP1 1 10V

High frequency, high current power inductors

Description

- Vertical design utilizes less board space
- Controlled DCR for sensing circuits
- Inductance Range from 195 nH to 320nH
- Current range from 42 to 70 amps
- 10.7 x 7.5mm and 10.5 x 6.2mm footprint surface mount package in a 9.5mm height
- Ferrite core material
- Halogen free, lead free, RoHS compliant

Applications

- Servers
- Multi-phase and Vcore regulators
- Voltage Regulator Modules (VRMs)
- Desktop VRMs and EVRDs
- Data networking and storage systems
- Point-of-Load modules
- DCR Sensing circuits

Environmental Data

- Storage temperature range (Component): -40°C to +125°C
- Operating temperature range: -40°C to +125°C (ambient + self-temperature rise)
- Solder reflow temperature: J-STD-020D compliant

Pb HALOGEN HF FREE RoHS

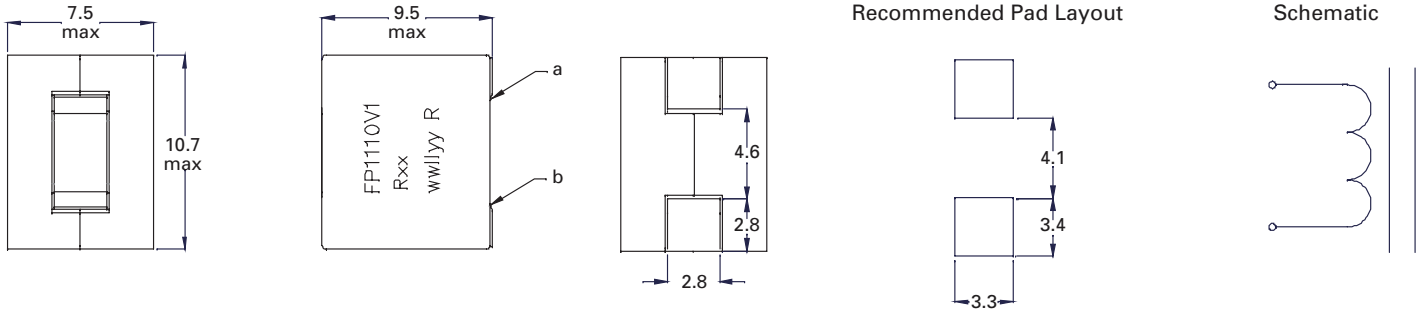
Powering Business Worldwide

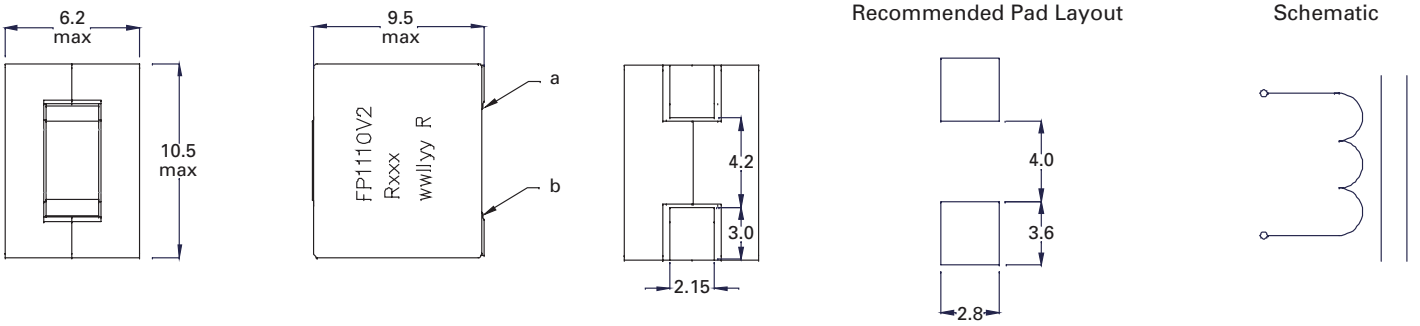
Product specifications

Part Number[7]	OCL[1] (nH) ±10%	FLL[2] minimum (nH)	I_{rms}[3] (amps)	I_{sat1}[4] (amps)	I_{sat2}[5] (amps)	DCR (mΩ) ±5% @ +20°C	K-factor[6]
V1-10.7 x 7.5 x 9.5mm							
FP1110V1-R20-R	195	140	61	70	58	0.23	278
FP1110V1-R22-R	220	158	61	64	51	0.23	278
FP1110V1-R27-R	270	173	61	55	44	0.23	278
FP1110V1-R32-R	320	230	61	42	34	0.23	278
V2-10.5 x 6.2 x 9.5mm							
FP1110V2-R200-R	200	144	61	65	52	0.18	328

1. Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.1Vrms, 0.0Adc, +25°C
2. Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1Vrms, @ $I_{sat}1$, @ +25ºC
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 @ +25ºC
5. I_{sat} : Peak current for approximately 20% rolloff @ +100ºC
6. K-factor: Used to determine B_{p-p} for core loss (see graph). $B_{p-p} = K * L * \Delta I * 10^{-3}$.
   B_{p-p}:(Gauss), K: (K-factor from table), L: (Inductance in nH), ΔI (Peak to peak ripple current in Amps).
7. Part Number Definition: FP1110Vx-Rxx(x)-R
   FP1110V = Product code
   x= DCR indicator
   Rxx(x)= Inductance value in uH, R= decimal point
   -R suffix = RoHS compliant

Dimensions (mm)





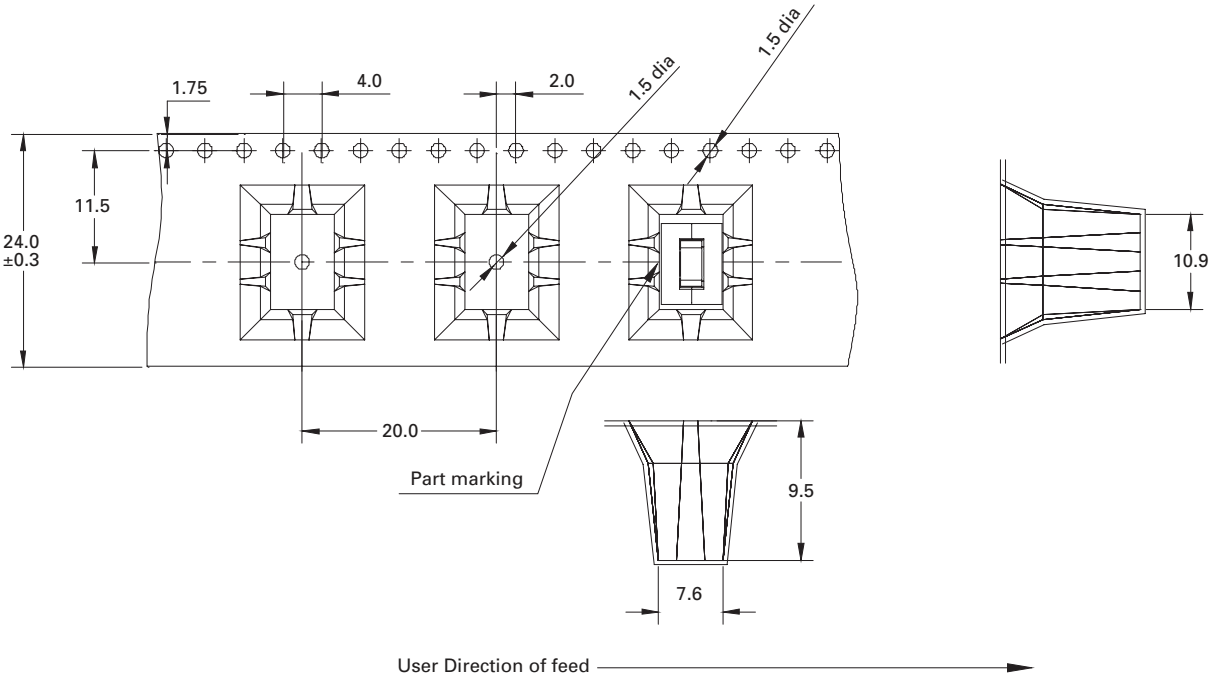
Part marking: FP1110V1 or V2, Rxx(x)=inductance value in µH, R=decimal point
wwllyy= date code, R=revision level
DCR measured from point "a" to point "b"
Soldering surfaces to be coplanar within 0.10 millimeters
Do not route traces or vias underneath the inductor.

Packaging information (mm)

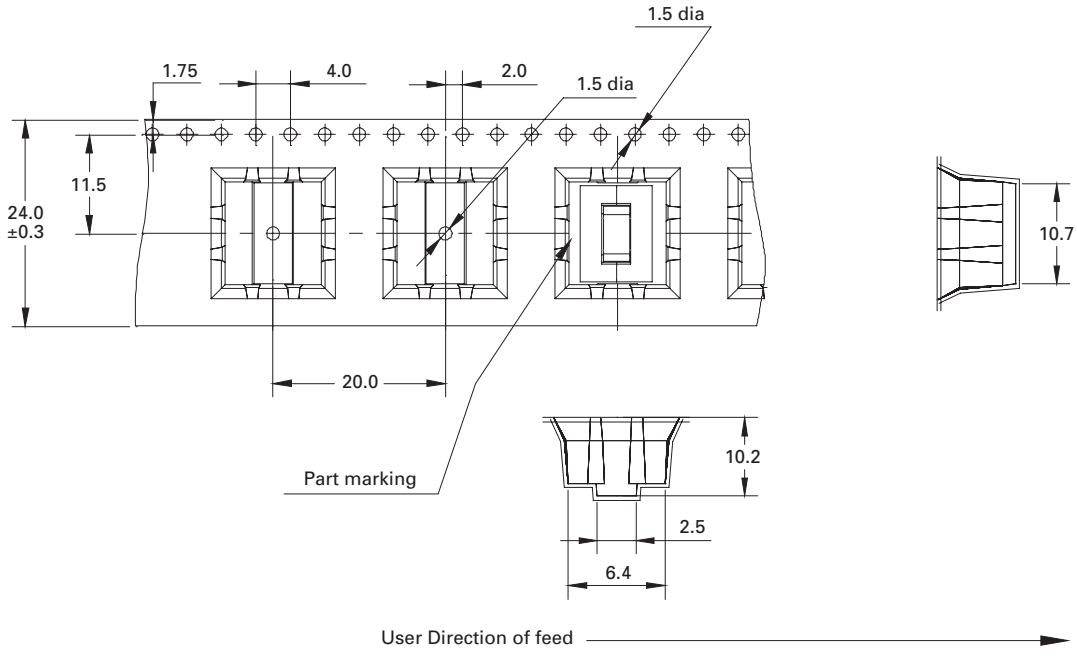
(Drawing not to scale)

(Supplied in tape and reel packaging, 300 parts per 13" diameter reel

FP1110V1

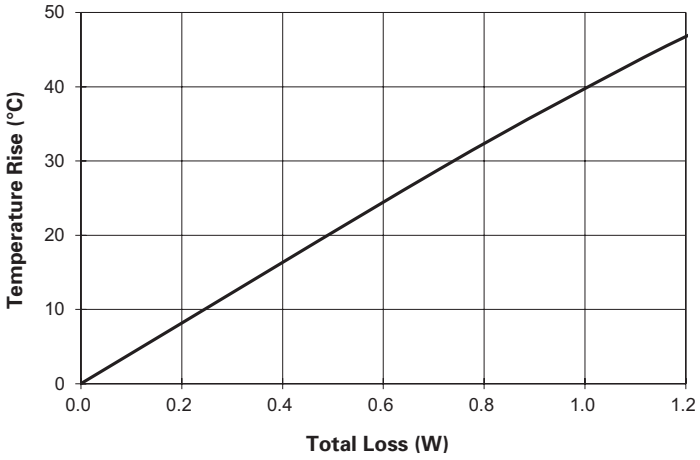


FP1110V2

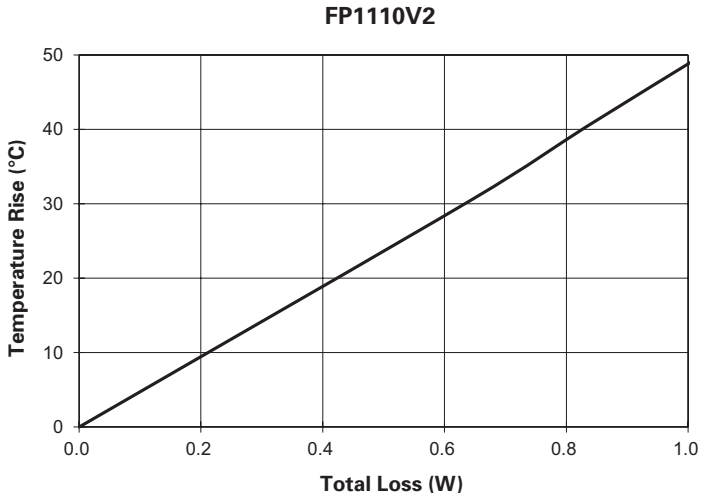


Temperature rise vs. total loss

FP1110V1

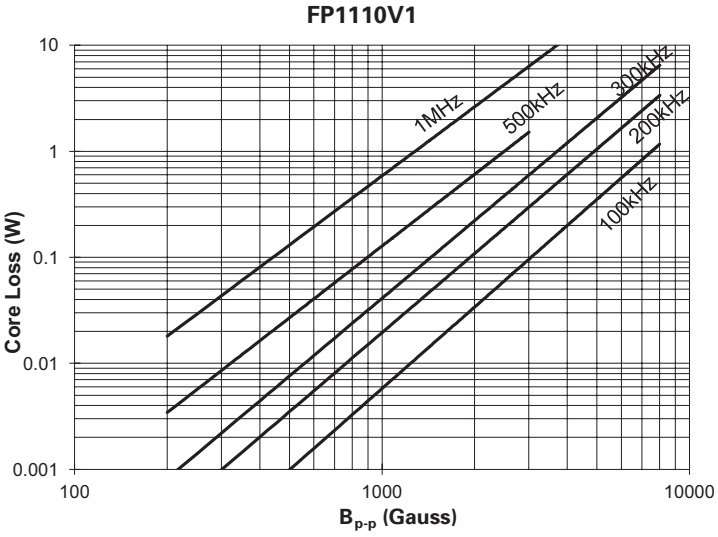


FP1110V2

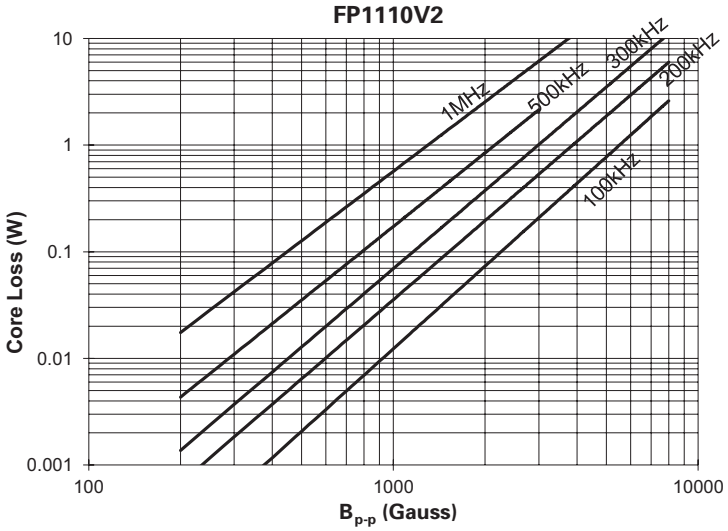


Core loss vs. B_{p-p}

FP1110V1

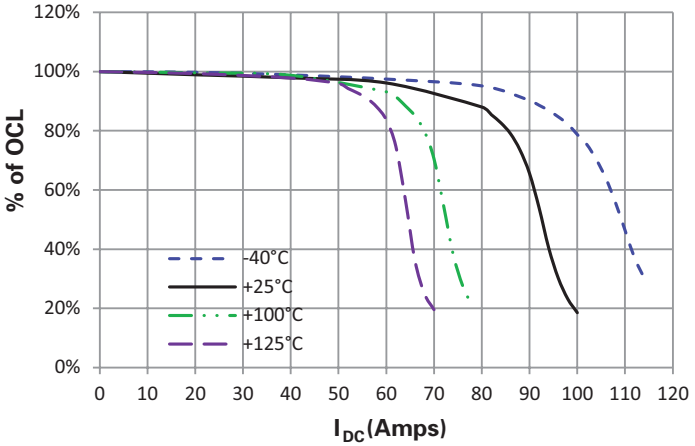


FP1110V2

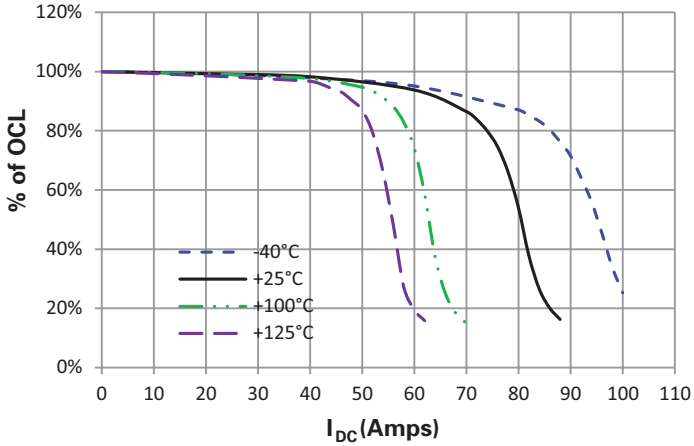


Inductance characteristics

FP1110V1-R20-R



FP1110V1-R22-R



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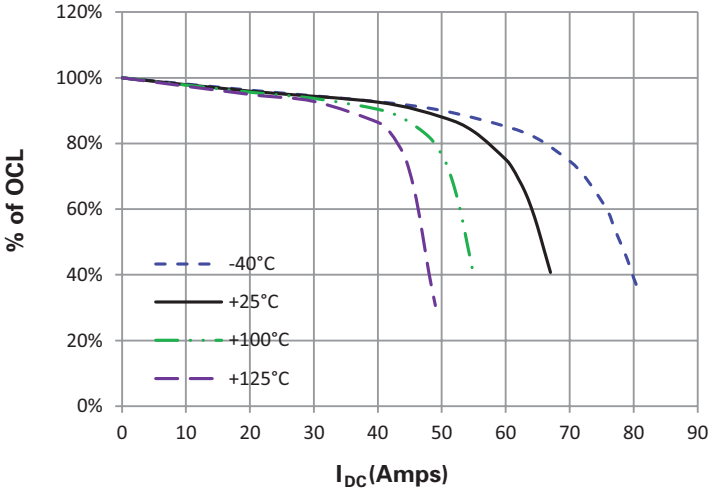

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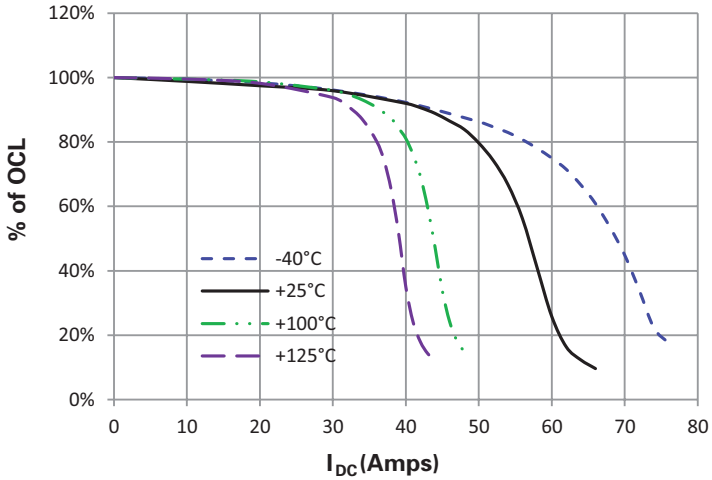
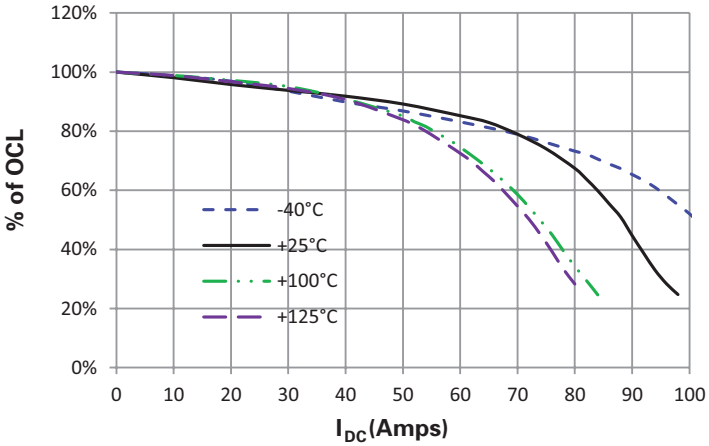


FP1110V2-R200-R



Solder reflow profile

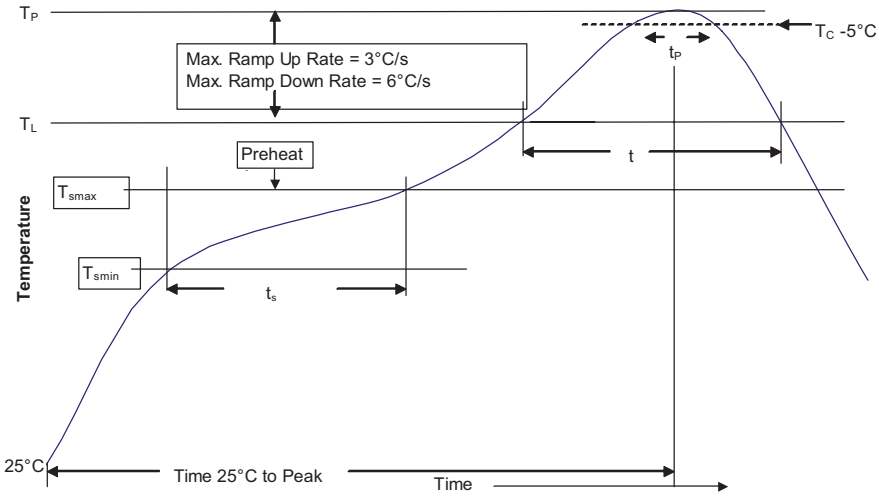


Table 1 - Standard SnPb Solder (T_C)

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) Time at liquidous (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**
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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