FP1505

High frequency, high current power inductors

Product features

- 7.0 x 15.0 x 5.0mm surface mount package
- Ferrite core material
- High current handling capability, low core loss
- Designed for high speed, high current switch mode applications
- Tight DCR tolerance for sensing circuits
- Inductance range from 100 nH to 400 nH
- Current range from 24 A to 105 A
- Frequency range up to 1 MHz

Applications

- Multi-phase regulators
- Voltage Regulator Module (VRM)
- Desktop and server VRMs and EVRDs
- Data networking and storage systems
- Notebook regulators
- Graphics cards and battery power systems
- Point of load modules
- DCR current 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

Pb HALOGEN HF FREE RoHS

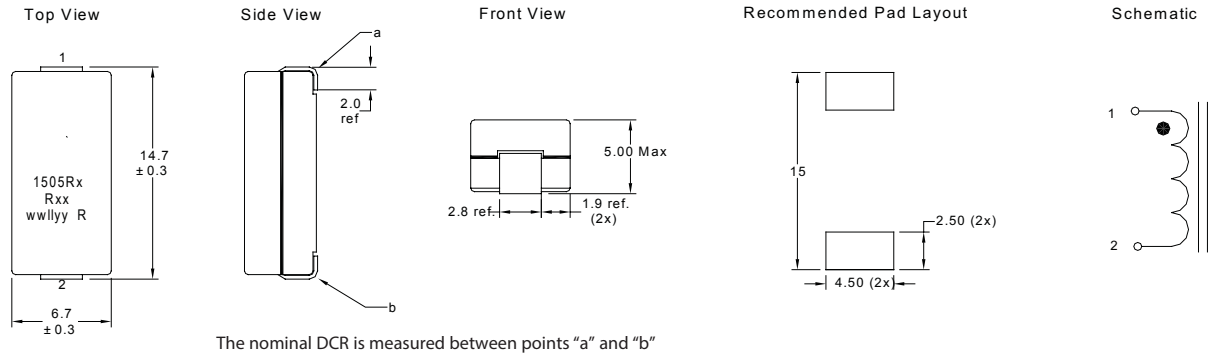
Powering Business Worldwide

Product specifications

Part Number[7]	OCL[1] ± 10% (nH)	FLL[2] Min. (nH)	I_{rms}[3] (A)	$I_{sat}1$[4] (A) @+25 °C	$I_{sat}2$[5] (Amps) @+125 °C	DCR (mΩ) @+20 °C	K-factor[6]
FP1505R1-R10-R	100	72	53	105	90	0.47 ± 7%	356.3
FP1505R1-R12-R	120	86		87	75		356.3
FP1505R1-R15-R	150	108		72	60		356.3
FP1505R1-R25-R	250	180		42	32		356.3
FP1505R1-R30-R	300	217		35	26		356.3
FP1505R1-R40-R	400	288		24	19.5		356.3

1 Open Circuit Inductance (OCL) Test Parameters: 100 kHz, 1.0 V_{rms}, 0.0 Adc
2 Full Load Inductance (FLL) Test Parameters: 100 kHz, 1.0 V_{rms}, $I_{sat}1$
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 at +25 °C.
5 $I_{sat}2$: Peak current for approximately 20% rolloff at +125 °C.
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: FP1505Rx-Rxx-R
- FP1505 = Product code and size
- Rx= DCR indicator
- Rxx= Inductance value in uH, R = decimal point
- -R suffix = RoHS compliant

Dimensions- mm

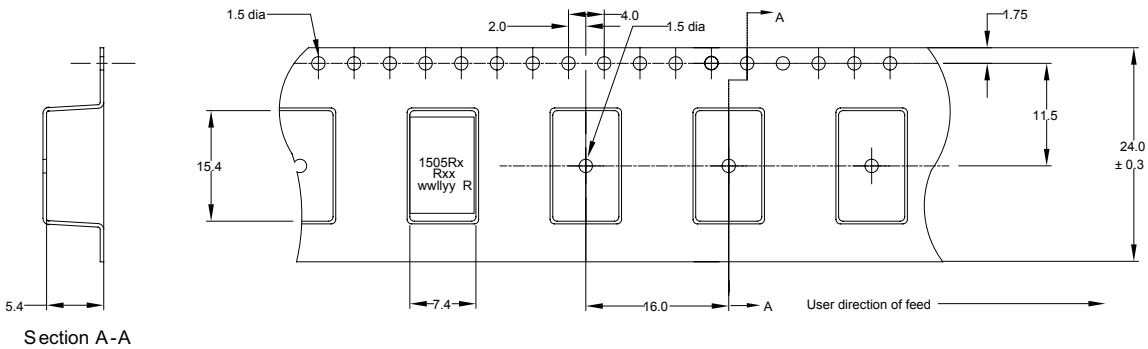


The nominal DCR is measured between points "a" and "b"

Part Marking: 1505Rx Rx = DCR indicator Rxx = Inductance value in µH. (R = Decimal point). wwllyy = Date code R = Revision level

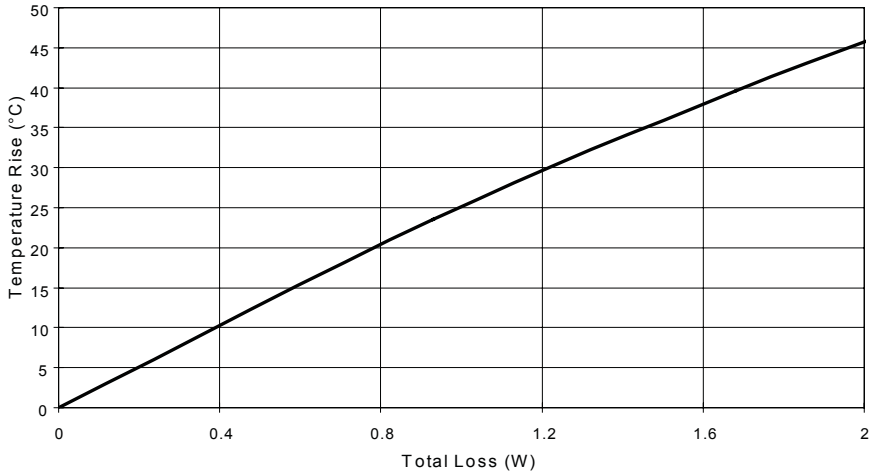
Do not route traces or vias underneath the inductor

Packaging information - mm

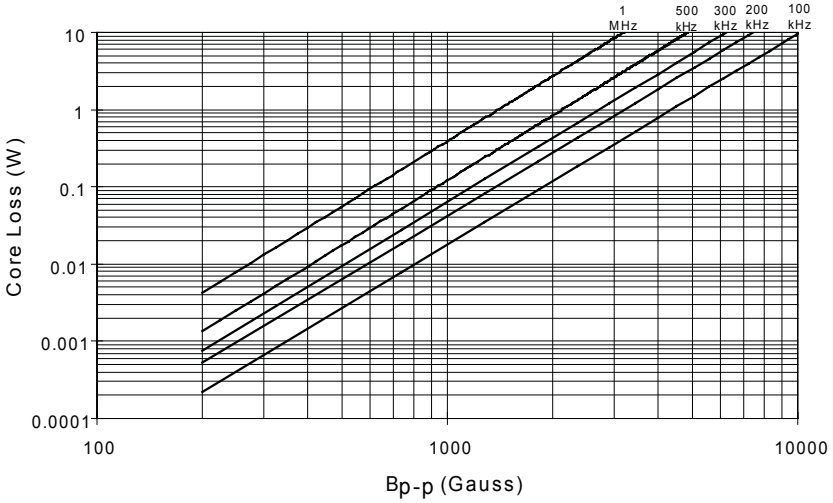


Supplied in tape-and-reel packaging, 744 parts per reel, 13" diameter reel.

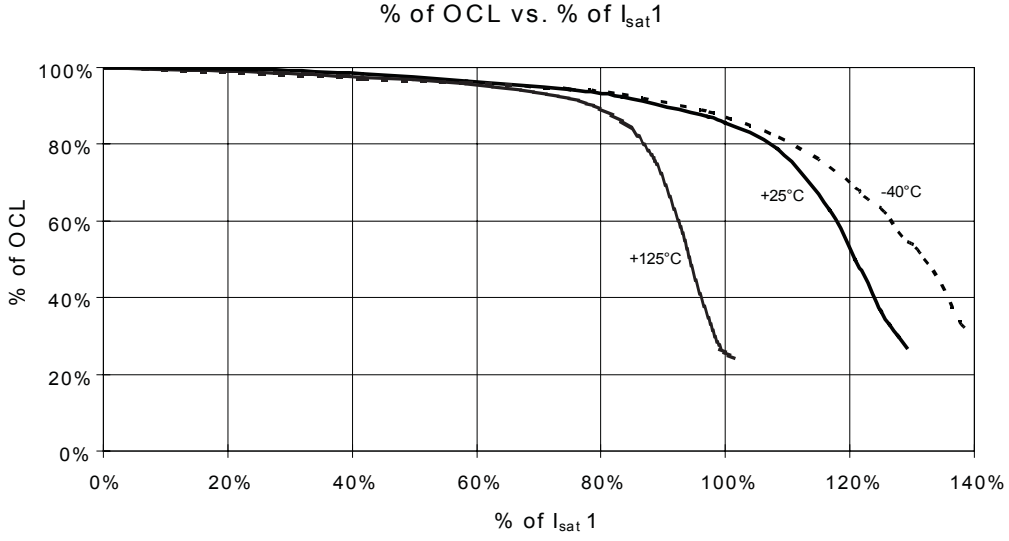
Temperature rise vs total loss



Core loss vs Bp-p



Inductance characteristics



Solder Reflow Profile

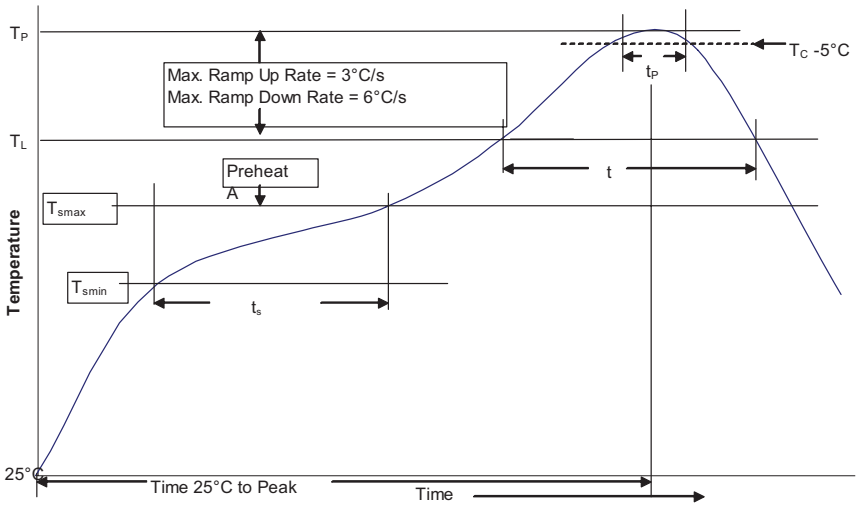


Table 1 - Standard SnPb Solder (T_C)

Package Thickness	Volume 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-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
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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