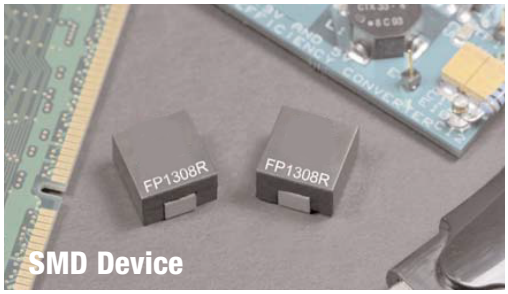
FP1308R

High frequency, high current power inductors



Product features

- 13.4 x 12.7 x 8.0mm surface mount package
- Ferrite core material
- High current carrying capacity, Low core losses
- Controlled DCR tolerance for sensing circuits
- Inductance range from 110nH to 440nH
- Current range from 37 to 120 Amps
- Frequency range up to 2MHz

Applications

- Multi-phase regulators
- Voltage Regulator Module (VRM)
- 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

Pb HALOGEN HF FREE RoHS

Powering Business Worldwide

Product Specifications							
Part Number[7]	OCL[1] ± 10% (nH)	FLL[2] (nH)	I_{rms}[3] (Amps)	$I_{sat}1$[4] @ 25°C (Amps)	$I_{sat}2$[5] @ 125°C (Amps)	DCR (mΩ) @ 20°C	K-factor[6]
R1 Version							
FP1308R1-R11-R	110	79	57	120	105	0.32 ± 9.4%	233
FP1308R1-R21-R	210	152		80	68		233
FP1308R1-R26-R	260	187		64	52		233
FP1308R1-R32-R	320	230		52	40		233
FP1308R1-R44-R	440	317		37	28		233
R2 Version							
FP1308R2-R11-R	110	79	45	120	105	0.53 ± 10%	233
FP1308R2-R21-R	210	152		80	68		233
FP1308R2-R26-R	260	187		64	52		233
FP1308R2-R32-R	320	230		52	40		233
FP1308R2-R44-R	440	317		37	28		233
R3 Version							
FP1308R3-R11-R	110	79	68	120	105	0.18 ± 20%	233
FP1308R3-R21-R	210	152		80	68		233
FP1308R3-R26-R	260	187		64	52		233
FP1308R3-R32-R	320	230		52	40		233
FP1308R3-R44-R	440	317		37	28		233

1 Open Circuit Inductance (OCL) Test Parameters: 100kHz, 1.0V_{rms}, 0.0Adc

2 Full Load Inductance (FLL) Test Parameters: 100kHz, 1.0V_{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 pad layout, trace thickness and width, air-flow and proximity of other heat generating components will affect the temperature rise. It is recommended the part temperature not exceed 125°C under worst case operating conditions verified in the end application.

4 I_{sat}: Peak current for approximately 20% rolloff at +25°C.

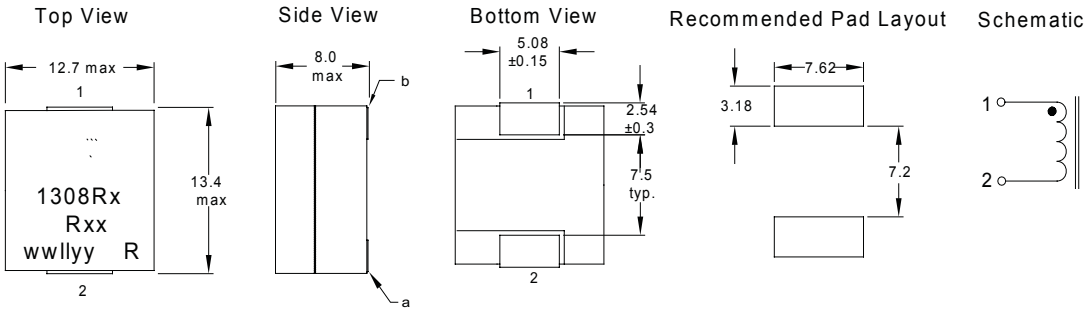
5 $I_{sat}2$: Peak current for approximately 20% rolloff at +125°C.

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: FP1308Rx-Rxx-R

- FP1308 = Product code and size
- Rx = DCR indicator
- Rxx = Inductance value in µH, R = decimal point.
- "-R" suffix = RoHS compliant

Dimensions- mm

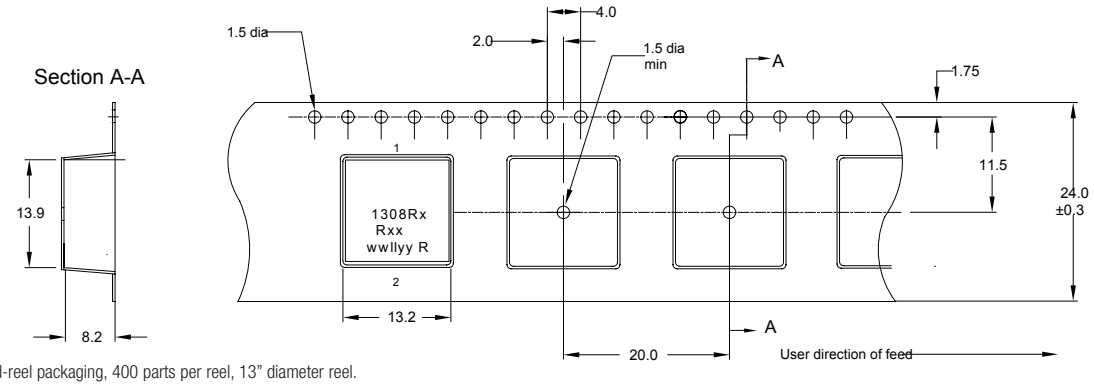


The nominal DCR is measured from point "a" to point "b"

All soldering surfaces to be coplanar within 0.1016mm.

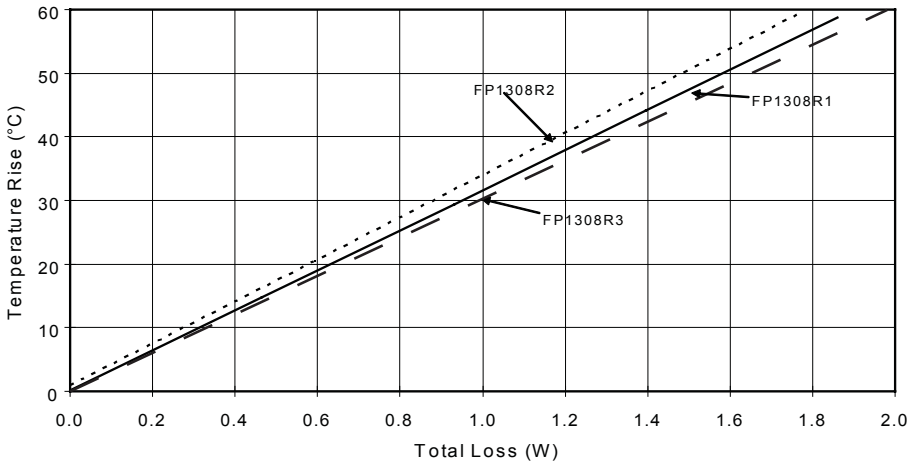
Part Marking: FP1308R (Rx = DRC indicator) Rxx = Inductance value in µH. (R = Decimal point). wwllyy = Date code R = Revision level

Packaging information - mm

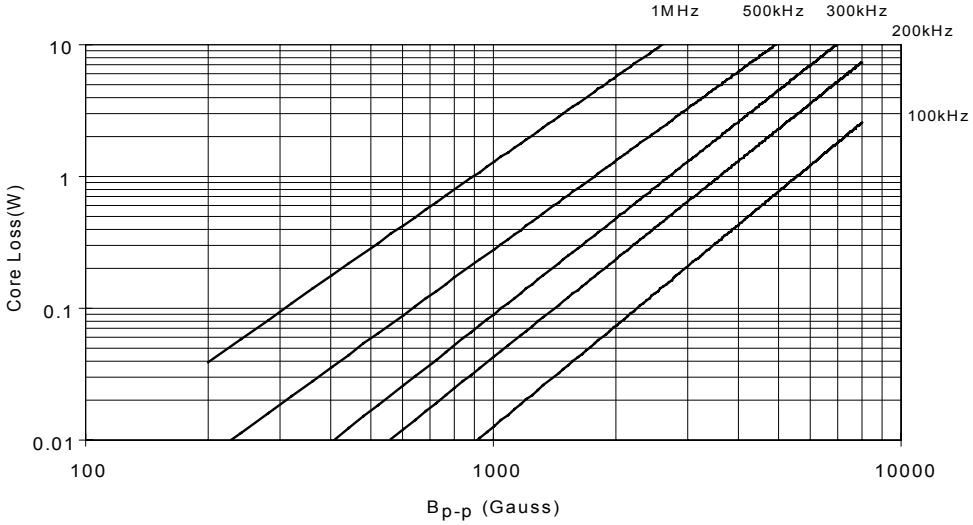


Supplied in tape-and-reel packaging, 400 parts per reel, 13" diameter reel.

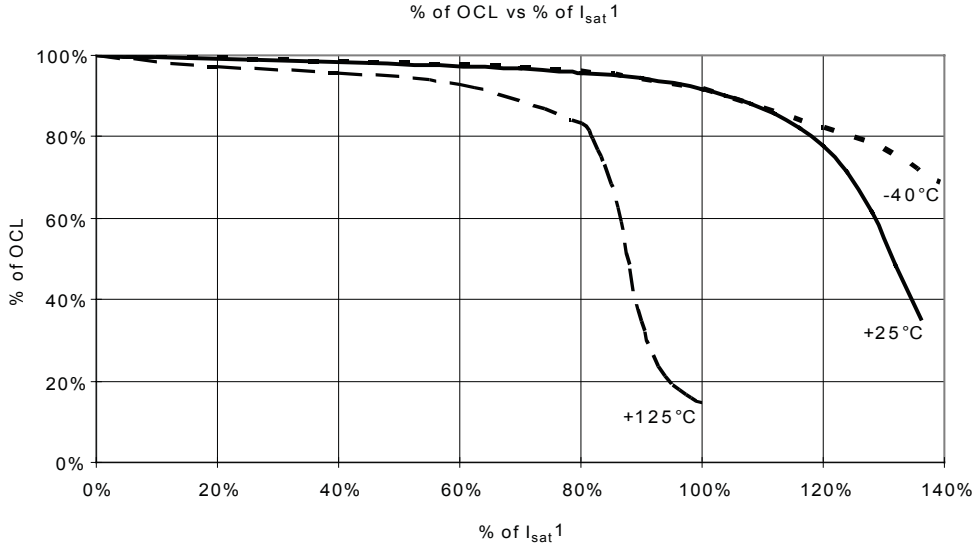
Temperature rise vs total loss



Core loss vs Bp-p



Inductance characteristics



Solder Reflow Profile

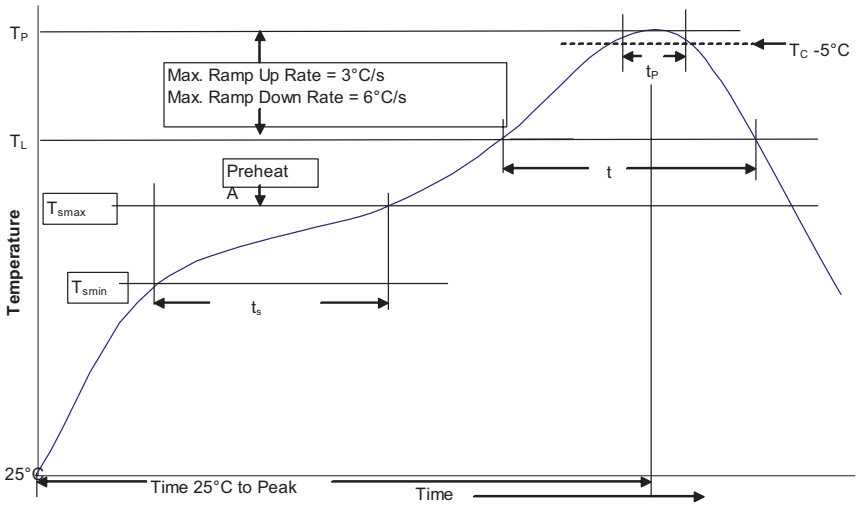


Table 1 - Standard SnPb Solder (T_C)

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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