

FP1008R1 and FP1008R2

High frequency, high current power inductors



Applications

- Servers
- Multi-phase and Vcore regulators
- Voltage Regulator Modules (VRMs)
- Desktop VRMs and EVRDs
- Data networking and storage systems
- Graphics cards and battery power 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

Product description

- High current carrying capacity
- Low core loss
- Controlled DCR for sensing circuits
- Inductance range from 120nH to 300nH
- Current range from 38 to 112 amps
- 10.8 x 8.0 mm footprint surface mount package in an 8.0 mm height
- Ferrite core material
- Halogen free, lead free, RoHS compliant



Powering Business Worldwide

Product specifications

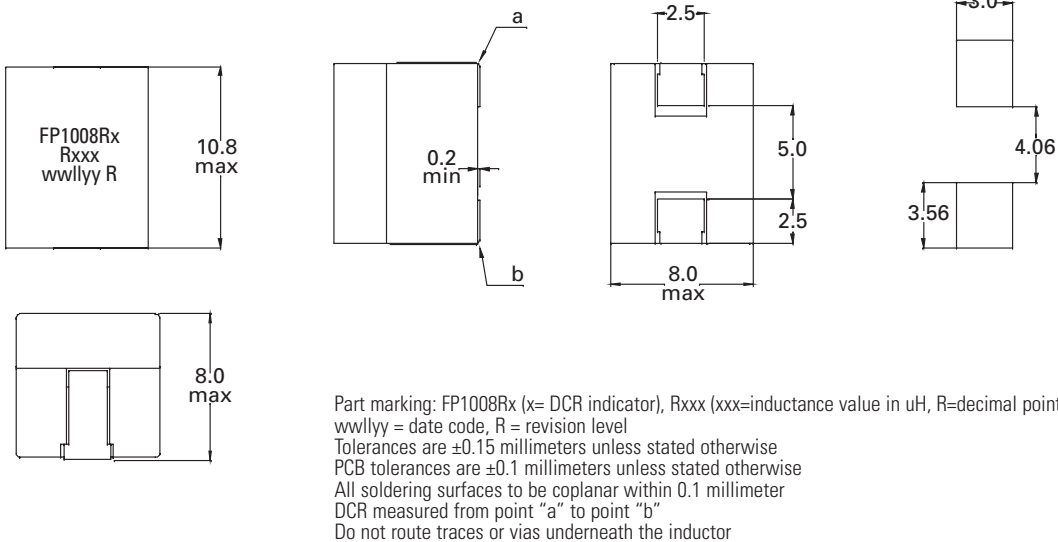
Part Number ⁹	OCL ¹ (nH)±10%	FLL ² (nH) minimum	I _{rms} ³ (amps)	I _{sat} 1 ⁴ (amps)	I _{sat} 2 ⁵ (amps)	I _{sat} 3 ⁶ (amps)	DCR (mΩ) ±5% @ 20°C	K-factor ⁷
R1 version								
FP1008R1-R120-R	120	86	79	112	92	84	0.17	342
FP1008R1-R150-R	150	108	79	90	72	67	0.17	342
FP1008R1-R180-R	180	130	79	74	60	54	0.17	342
FP1008R1-R220-R	220	158	79	56	44	42	0.17	342
FP1008R1-R270-R	270	194	79	44	34	32	0.17	342
FP1008R1-R300-R	300	216	79	38	30	28	0.17	342
R2 version								
FP1008R2-R120-R	120	86	74	112	92	84	0.18	342
FP1008R2-R150-R	150	108	74	90	72	67	0.18	342
FP1008R2-R180-R	180	130	74	74	60	54	0.18	342
FP1008R2-R220-R	220	158	74	56	44	42	0.18	342
FP1008R2-R270-R	270	194	74	44	34	32	0.18	342
FP1008R2-R300-R	300	216	74	38	30	28	0.18	342

- Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.1V_{rms}, 0.0Adc, +25°C
- Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1V_{rms}, I_{sat}1, +25°C
- 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.
- I_{sat}1: Peak current for approximately 20% rolloff @ +25°C
- I_{sat}2: Peak current for approximately 20% rolloff @ +100°C
- I_{sat}3: Peak current for approximately 20% rolloff @ +125°C
- K-factor: Used to determine B_{pp} for core loss (see graph).
B_{pp} = K * L * ΔI * 10⁻³. B_{pp} (Gauss), K: (K-factor from table),
L: (Inductance in nH), ΔI (Peak-to-peak ripple current in Amps).
- Part Number Definition: FP1008Rx-Rxxx-R
FP1008 R= Product code and size
x = DCR indicator
Rxxx = Inductance value in μH, R = decimal point
- R suffix = RoHS compliant

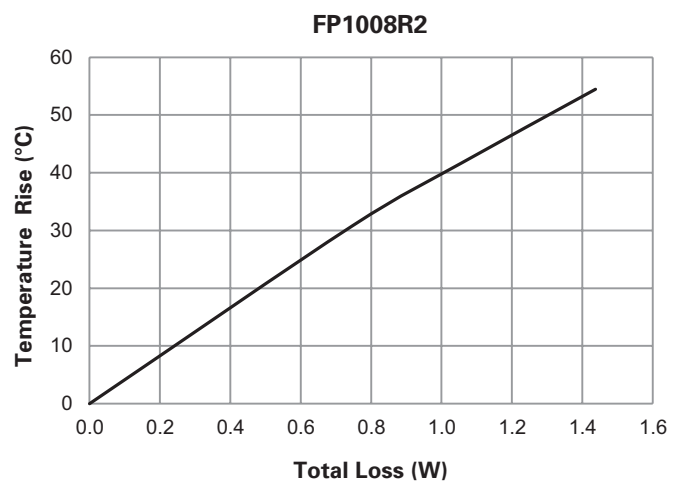
Dimensions (mm)

Recommended Pad Layout

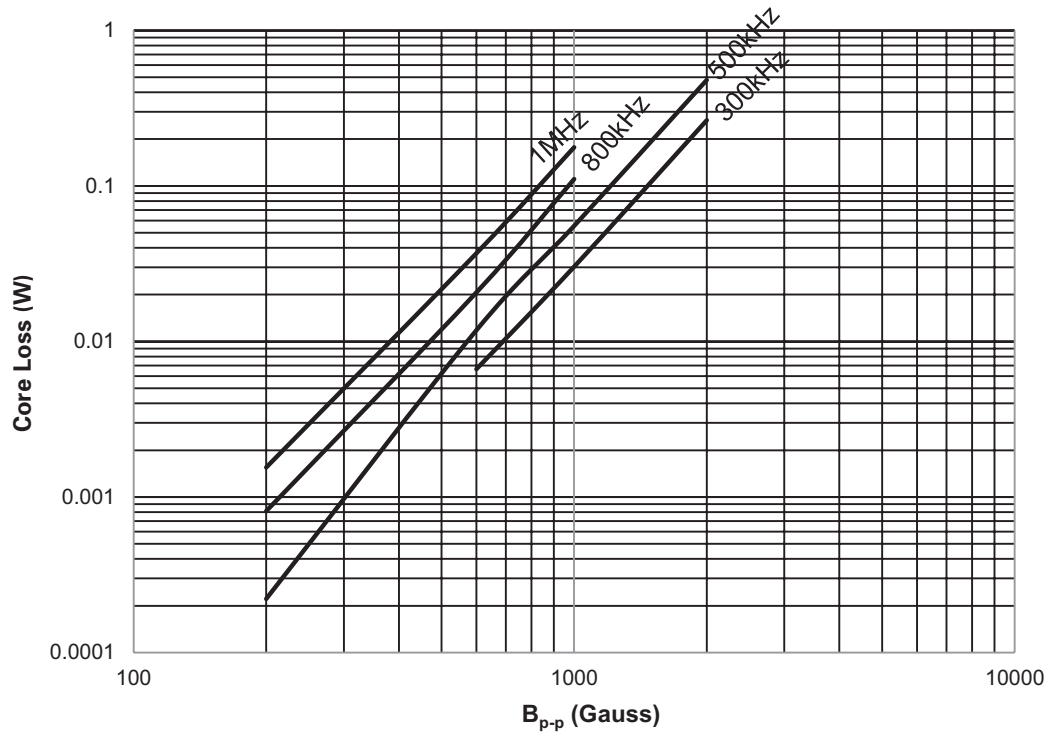
Schematic



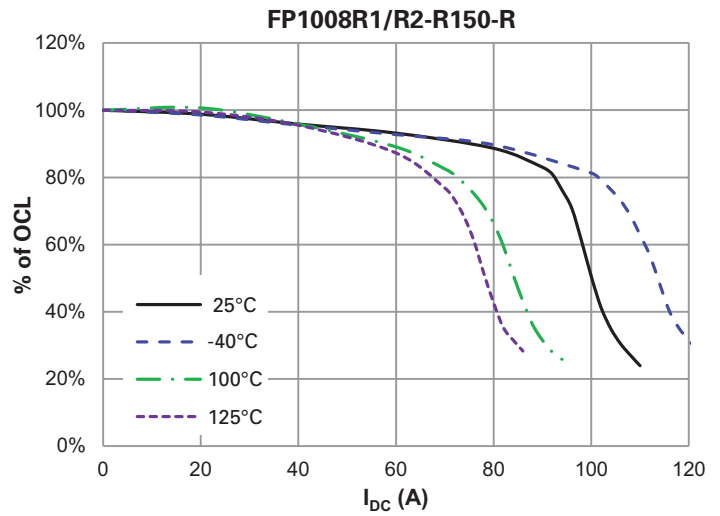
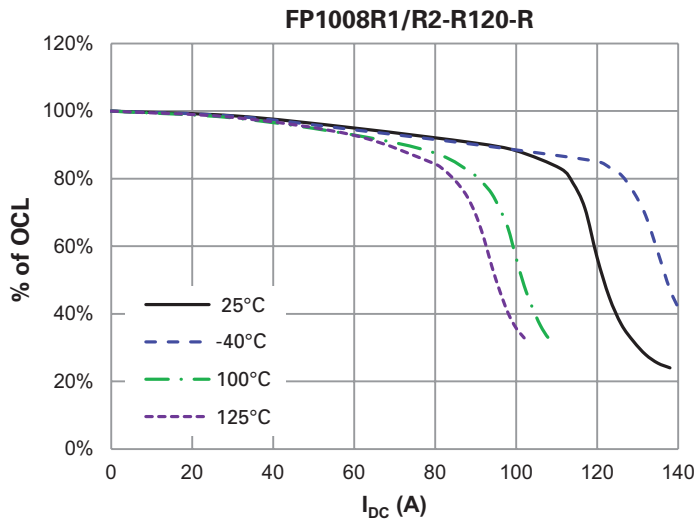
Supplied in tape and reel packaging, 500 parts per 13" diameter reel.



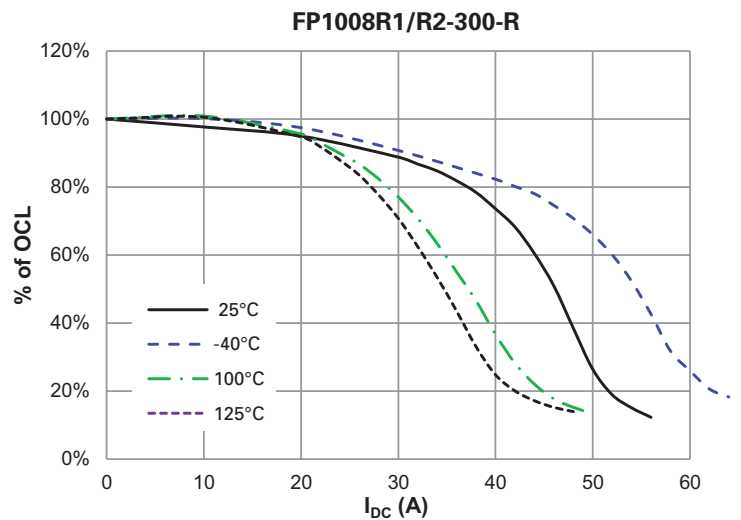
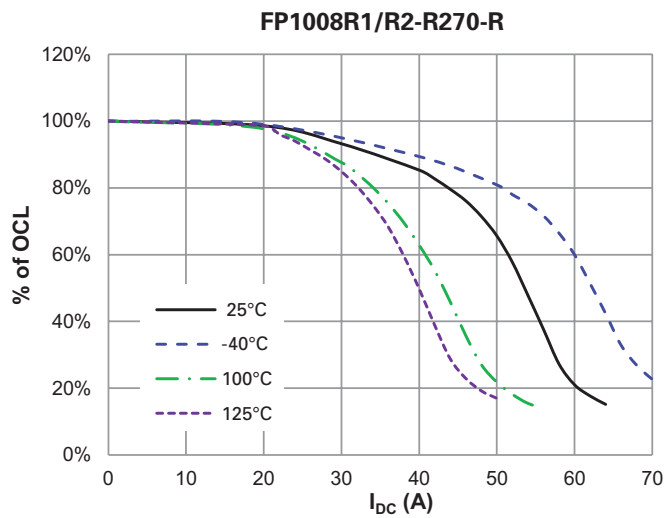
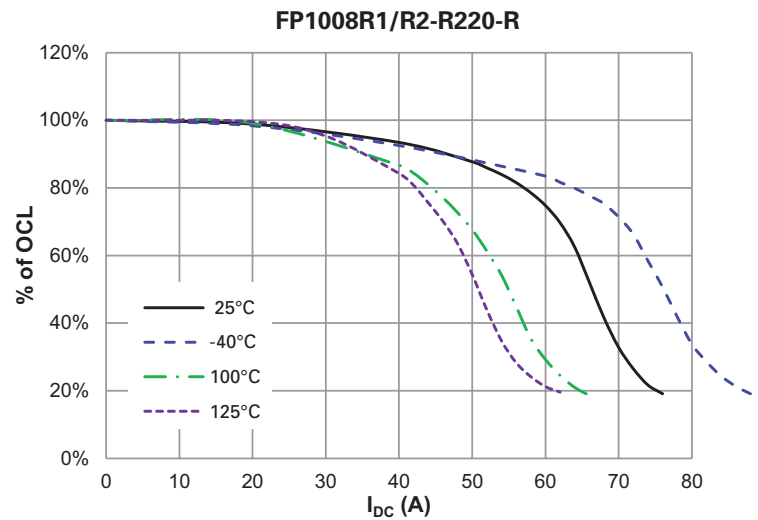
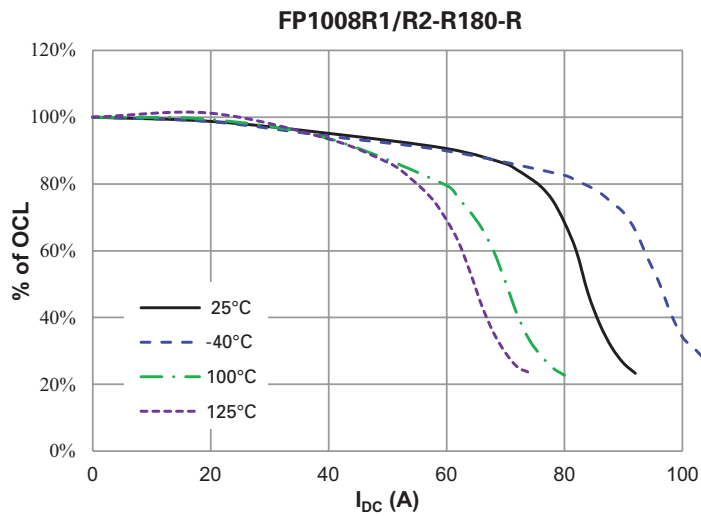
Core loss vs. Bp-p



Inductance characteristics



Inductance characteristics



Solder reflow profile

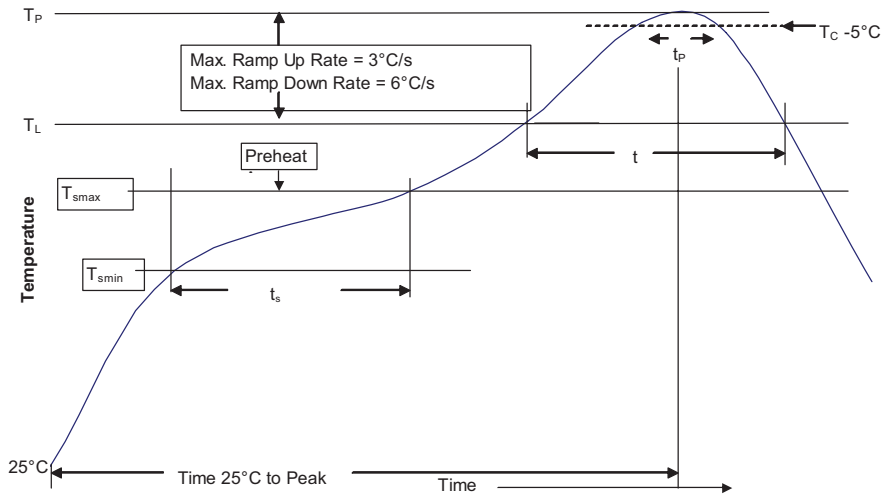


Table 1 - Standard SnPb Solder (T_C)

Package Thickness	Volume mm ³ <350	Volume mm ³ ≥350
<2.5mm)	235°C	220°C
≥2.5mm	220°C	220°C

Table 2 - Lead (Pb) Free Solder (T_C)

Package Thickness	Volume mm ³ <350	Volume mm ³ 350 - 2000	Volume mm ³ >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)	183°C	217°C
Time at liquidous (t_L)	60-150 Seconds	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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