FP1 1 10V

High frequency, high current power inductors

Product features

- Vertical design utilizes less board space
- Tight tolerance DCR for sensing circuits
- Inductance Range from 150 nH to 320 nH
- Current range from 42 A to 90 A
- 10.7 mm x 7.5 mm and 10.5 mm x 6.2 mm footprint surface mount package in a 9.5 mm height
- Ferrite core material
- Moisture sensitivity level (MSL): 1

Applications

- Multi-phase and Vcore regulators
- Voltage Regulator Modules (VRMs)
  - Server and desktop
  - Central processing unit (CPU
  - Graphics processing unit (GPU))
  - Application specific integrated circuit (ASIC)
  - High power density
- Data networking and storage systems
- Graphics cards and battery power systems
- Portable electronics
- Point-of-load modules
- DCR sensing circuits

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

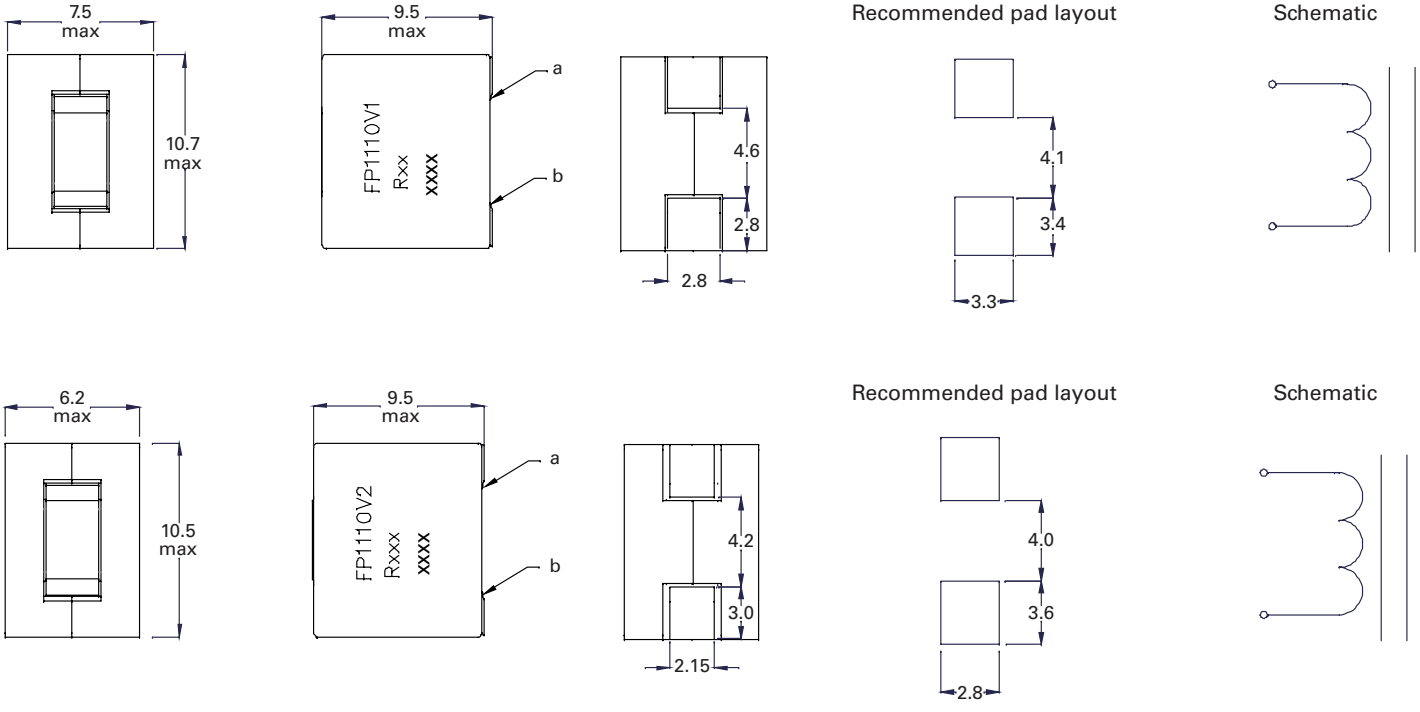
Powering Business Worldwide

Product specifications

Part number[7]	OCL[1] (nH) ±10%	FLL[2] (nH) minimum	I_{rms}[3] (A)	I_{sat1}[4] (A)	I_{sat2}[5] (A)	DCR (mΩ) ±5% @ +20°C	K-factor[6]
V1 version							
FP1110V1-R15-R	150	108	61	90	72	0.23	278
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 version							
FP1110V2-R150-R	150	108	61	89	70	0.18	328
FP1110V2-R180-R	180	130	61	72	57.5	0.18	328
FP1110V2-R200-R	200	144	61	65	52	0.18	328
FP1110V2-R220-R	220	159	61	59	47	0.18	328
FP1110V2-R270-R	270	195	61	48	38.5	0.18	328
FP1110V2-R320-R	320	230	61	40.5	32.5	0.18	328

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} : Peak current for approximately 20% rolloff @ +100 °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: FP1110Vx-Rxx(x)-R
   FP1110V = Product code
   x= Version indicator
   Rxx(x)= Inductance value in uH, R= decimal point
   -R suffix = RoHS compliant

Dimensions- mm



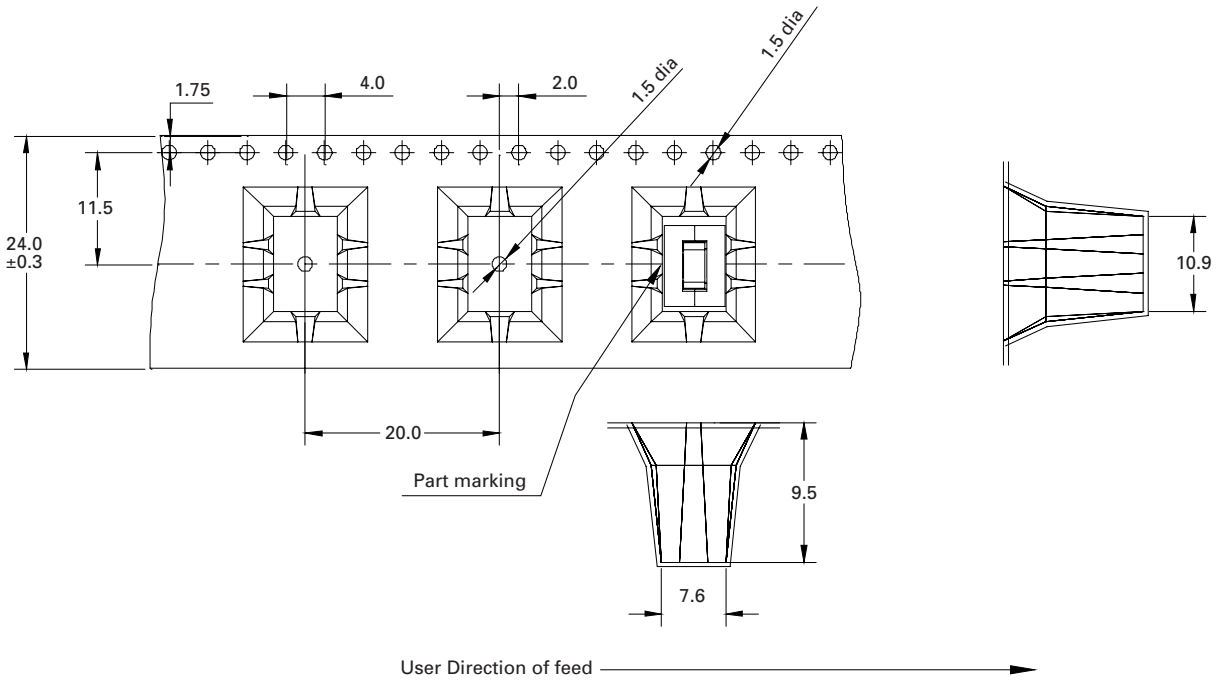
Part marking: FP1110Vx (x=Version indicator), Rxx(x)=inductance value in µH, R=decimal point
xxxx= lot code
DCR measured from point "a" to point "b"
Soldering surfaces to be coplanar within 0.10 millimeters
Traces or vias underneath the inductor is not recommended.

Packaging information- mm

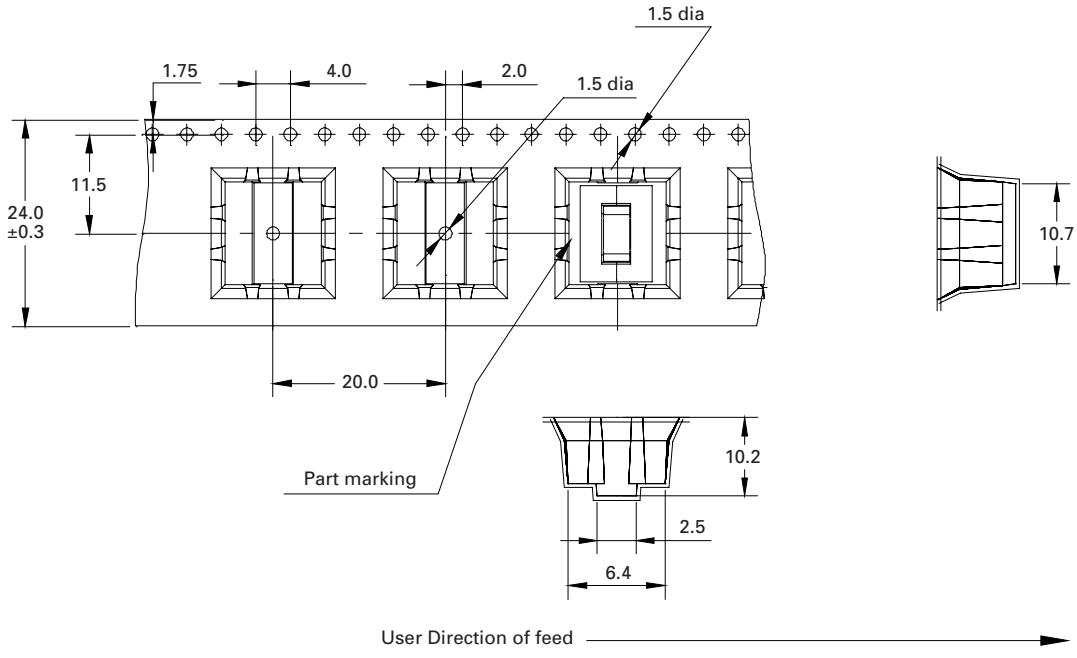
(Drawing not to scale)

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

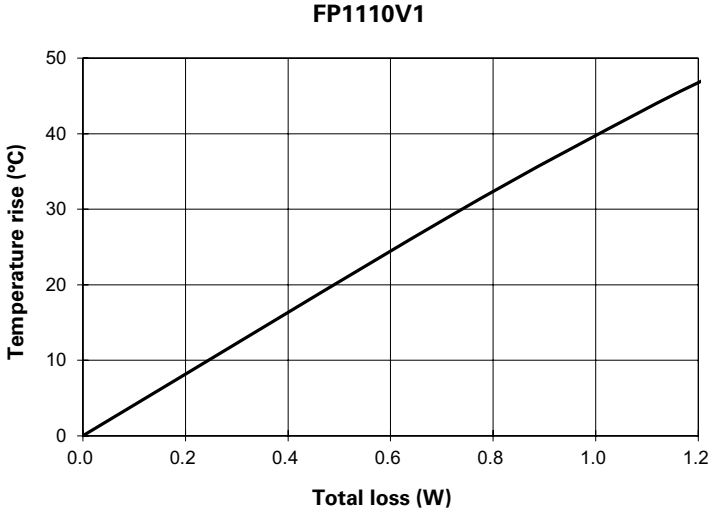
FP1110V1

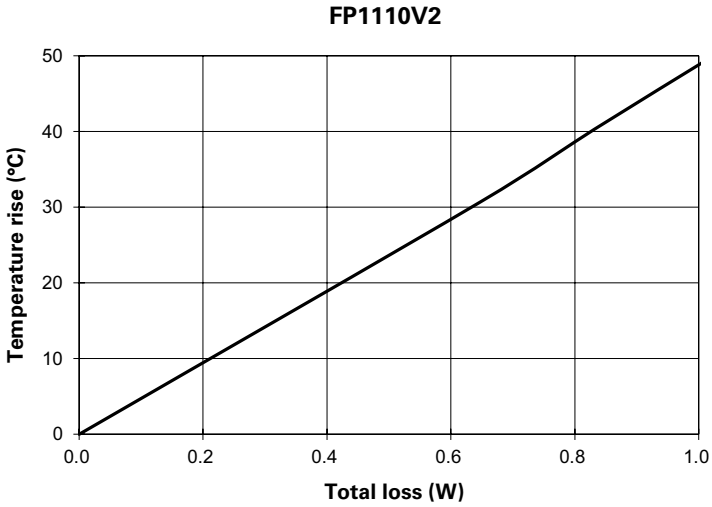


FP1110V2

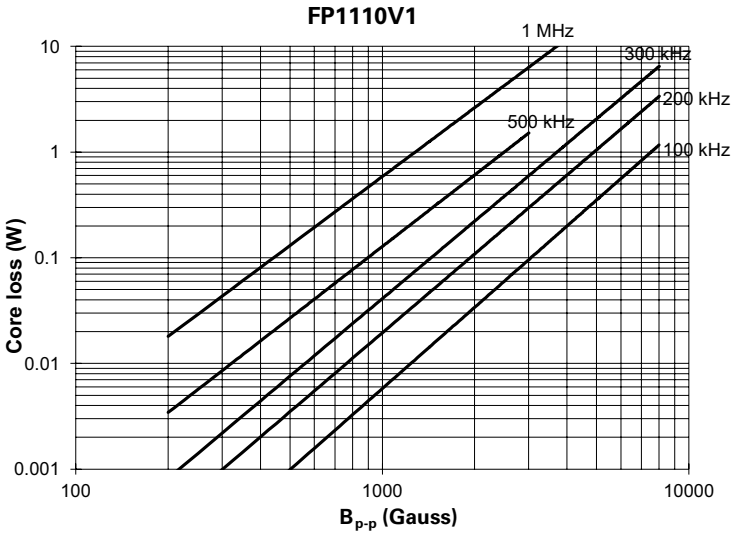


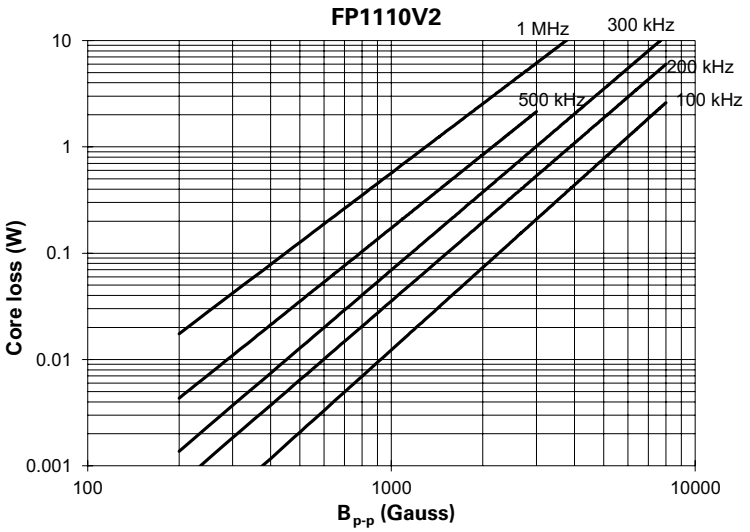
Temperature rise vs. total loss





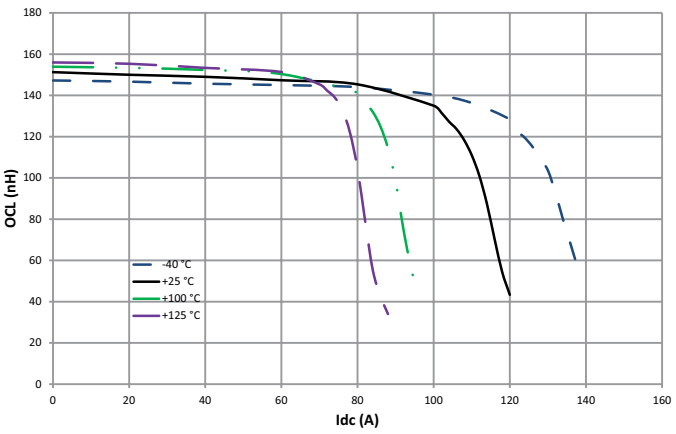
Core loss vs. B_{p-p}



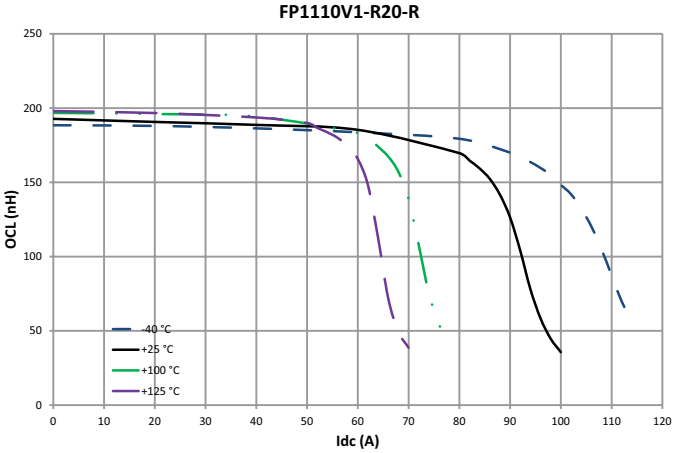


Inductance characteristics

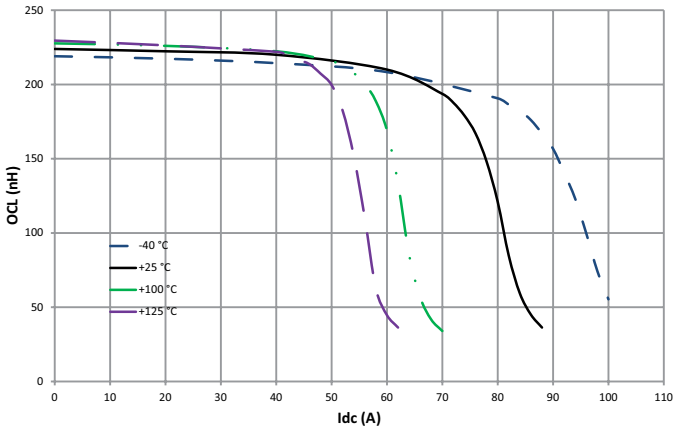
FP1110V1-R15-R



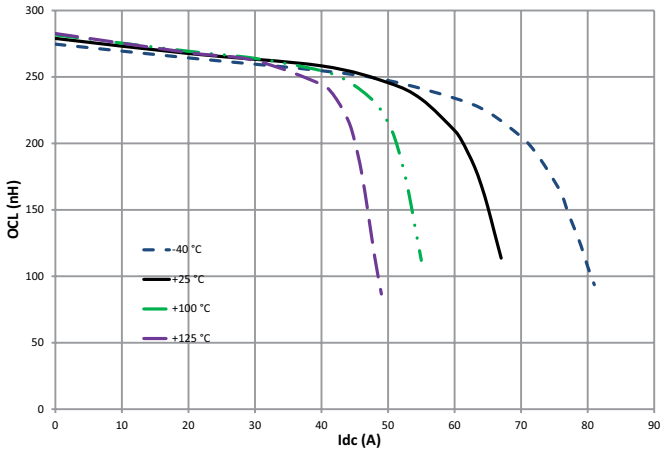
FP1110V1-R20-R



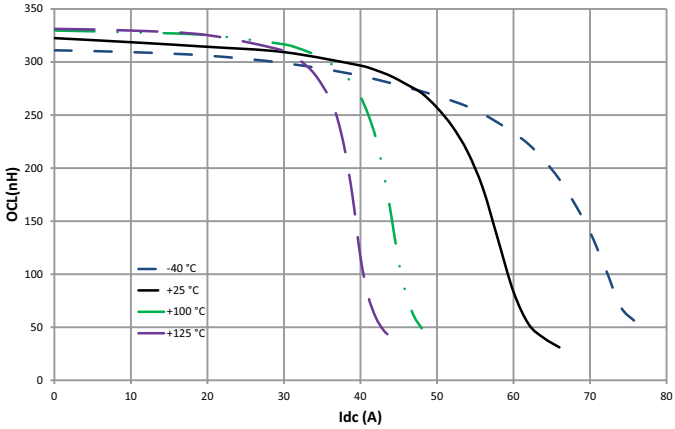
FP1110V1-R22-R



FP1110V1-R27-R

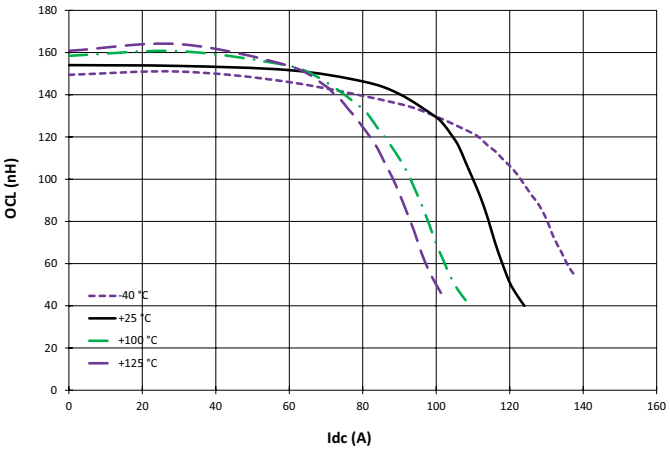


FP1110V1-R32-R

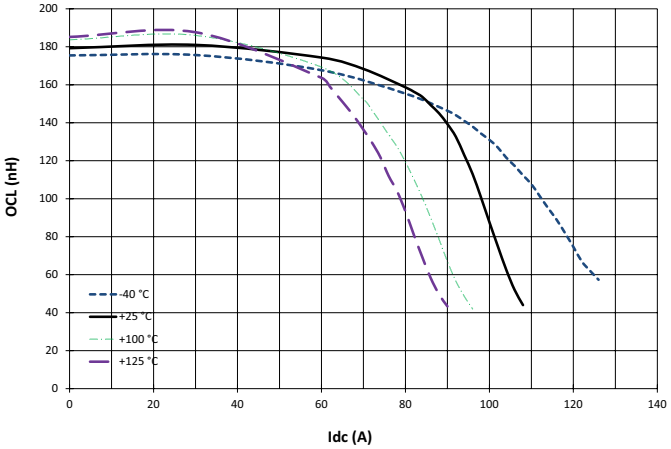


Inductance characteristics

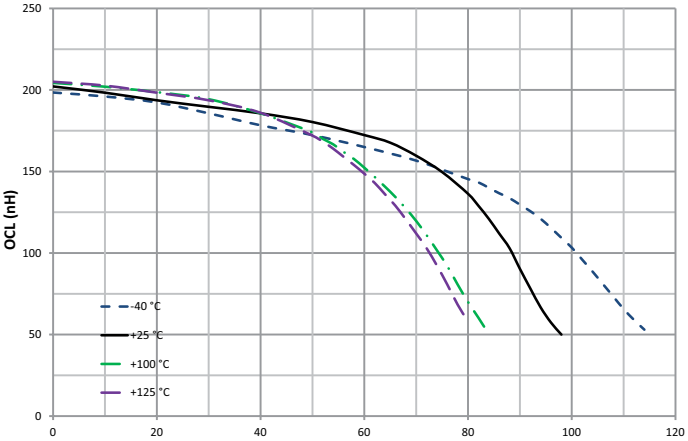
FP1110V2-R150-R



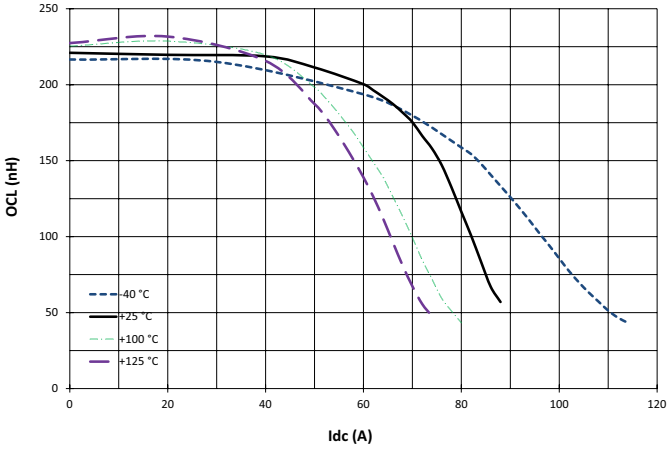
FP1110V2-R180-R



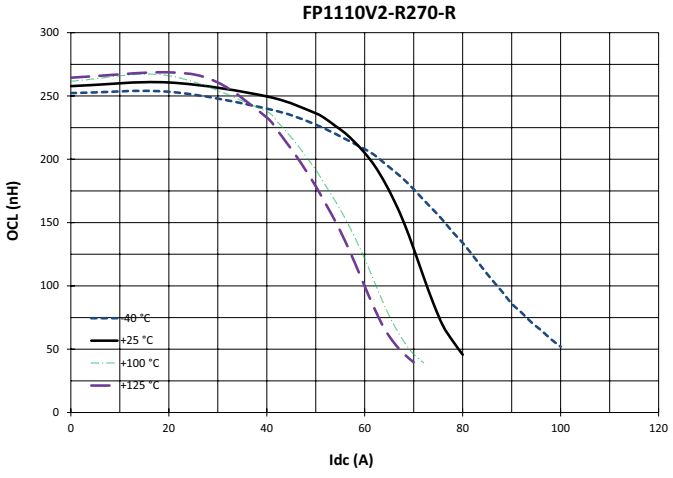
FP1110V2-R200-R



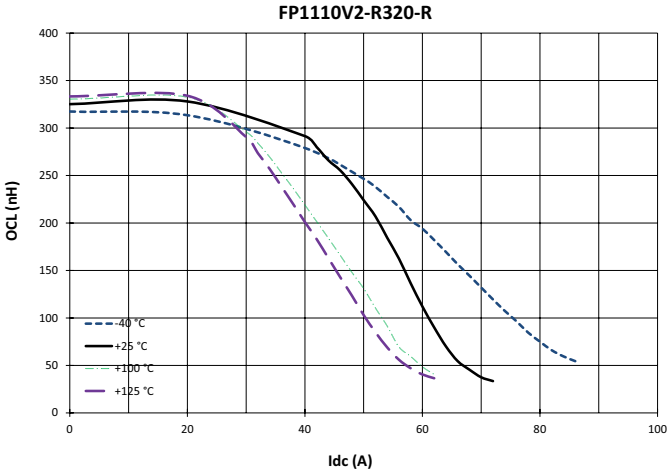
FP1110V2-R220-R



FP1110V2-R270-R



FP1110V2-R320-R



Solder reflow profile

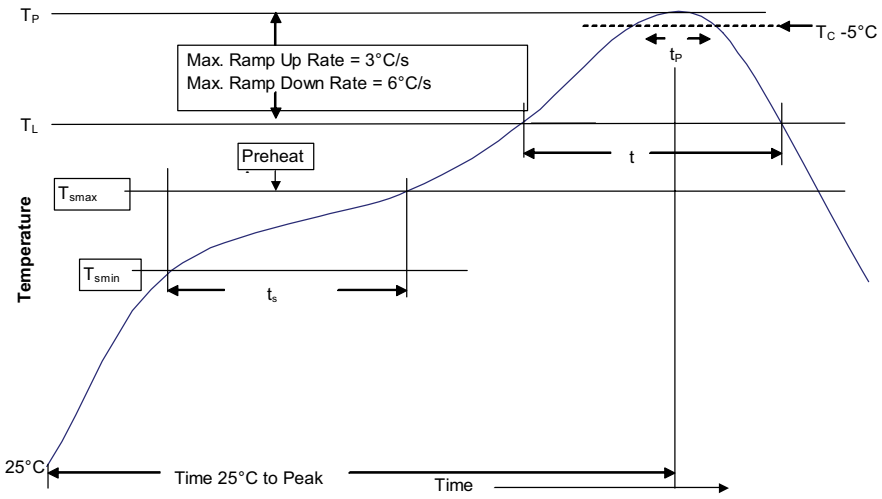


Table 1 - Standard SnPb solder (T_C)

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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