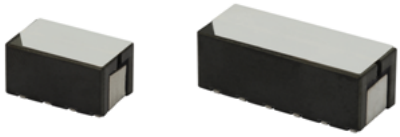
CL1110R

Multi-phase power inductor



Product features

- High current multi-phase inductor
- 50 nH per phase coupled inductor
- Ferrite core material
- Patents pending
- 11.8 mm wide x 10.5 mm high footprint surface mount package with 19.5 mm and 29.0 mm lengths
- Moisture sensitivity level (MSL): 1
- Termination finish matte tin over nickel

Applications

- For exclusive use with Maxim® VPR-Devices Voltage Regulator Modules (VRMs)

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

Pb HALOGEN HF FREE RoHS

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Product specifications

Part number[7]	Inductor phases	OCL[1] (nH) typical	OCL[1] (nH) minimum	FLL[2] (nH) minimum	$I_{sat}1$[4] (A)	$I_{sat}2$[5] (A)	DCR (mΩ) maximum @ +20 °C	SCL[3] (nH) ±20%	$I_{sat}3$[6] (A)
CL1110R1-4-R050-R	4	250	220	200	20	15	0.30	50	70
CL1110R1-6-R050-R	6	250	220	200	20	15	0.30	50	70

1. Open circuit inductance (OCL) test parameters: 1 MHz, 0.1 V_{rms}, 0.0 Adc, +105 °C
2. Full load inductance (FLL) test parameters: 1 MHz, 0.1 Vrms, $I_{sat}1$, +105 °C
3. Short Circuit Inductance (SCL) Test Parameters: 1MHz, 0.1Vrms, 0.0Adc, +105 °C
4. $I_{sat}1$: Peak current at which per phase OCL drops by approximately 20% at +25 °C
5. $I_{sat}2$: Peak current at which per phase OCL drops by approximately 20% at +105 °C
6. $I_{sat}3$: Peak current at which per phase SCL drops by approximately 20% at +105 °C
7. Part Number Definition: CL1110Rx-Rxxx-R
   CL1110R = Product code and size
   x = Version indicator
   Rxxx = inductance value in µH, R= decimal point.
   R suffix = RoHS compliant

Note: The rated current and rated inductance per phase is determined by Maxim's testing and circuit design. Additional information can be provided by contacting Maxim.

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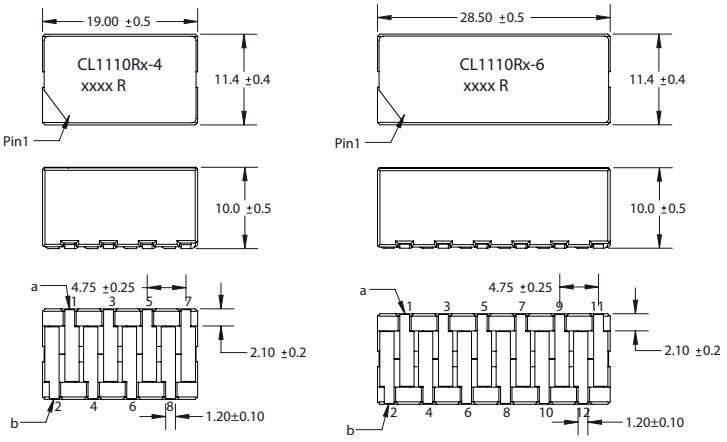
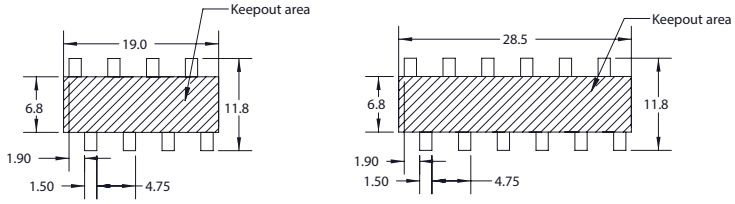
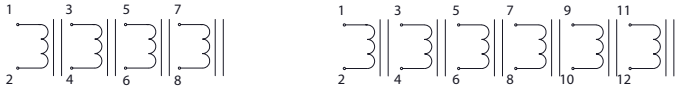
Dimensions- (mm)



Recommended pad layout



Schematic



Marking: CL1110Rx-y=(x= Version indicator, y=Number of phases) xxxx= Lot code, R=(Revision level)

Tolerances are ±0.15 millimeters unless stated otherwise

All soldering surfaces to be coplanar within 0.1 millimeters

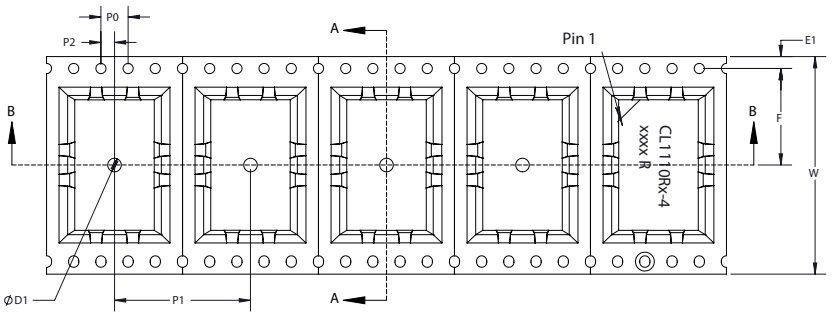
Pad layout tolerances are ±0.1 millimeters unless stated otherwise

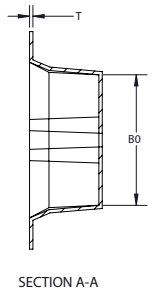
DCR measured from point "a" to point "b"

Traces or vias underneath the inductor is not recommended

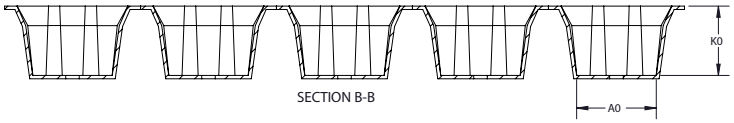
Packaging information- (mm)
Supplied in tape and reel packaging on a 13" diameter reel
Drawing not to scale

CL1110R1-4-R050-R
200 parts per reel

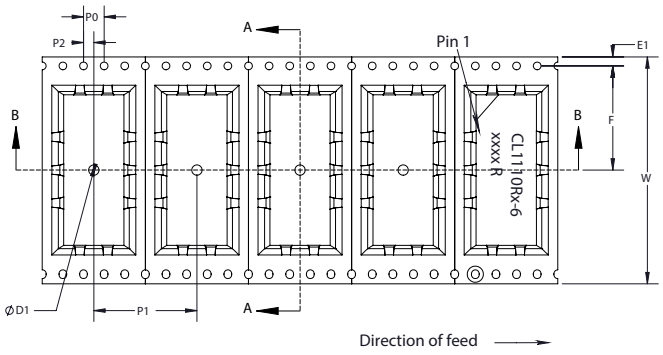


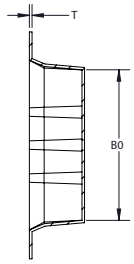


W±0.30	32.0
F±0.10	14.2
E1±0.10	1.75
P0±0.10	4.00
P1±0.10	20.0
P2±0.10	2.00
D0+0.10/-0	1.50
D1 Min	2.00
A0±0.10	12.0
B0±0.10	19.7
K0±0.10	10.7
T±0.05	0.50

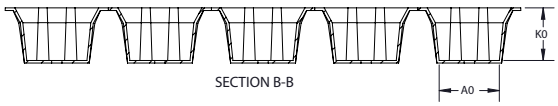


CL1110R1-6-R050-R
200 parts per reel

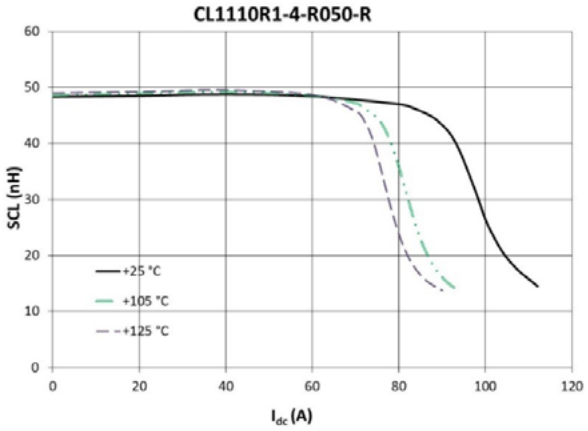


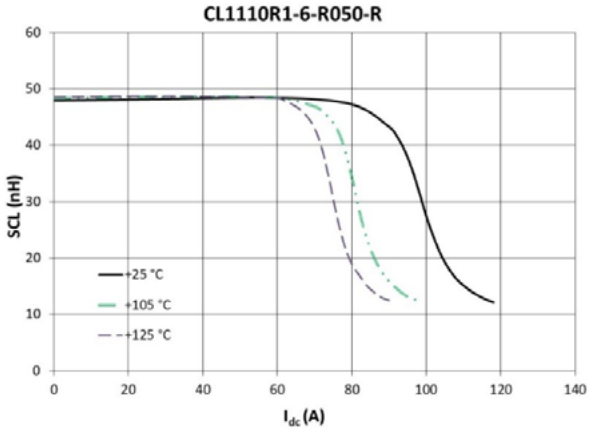


W±0.30	44.0
F±0.10	20.2
E1±0.10	1.75
P0±0.10	4.00
P1±0.10	20.0
P2±0.10	2.00
D0+0.10/-0	1.50
D1 Min	2.00
A0±0.10	12.0
B0±0.10	29.2
K0±0.10	10.7
T±0.05	0.50

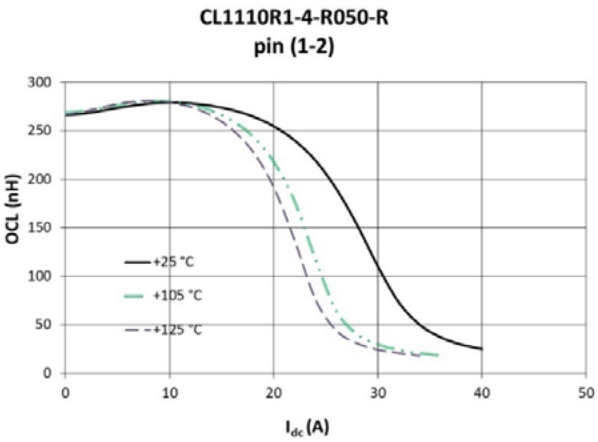


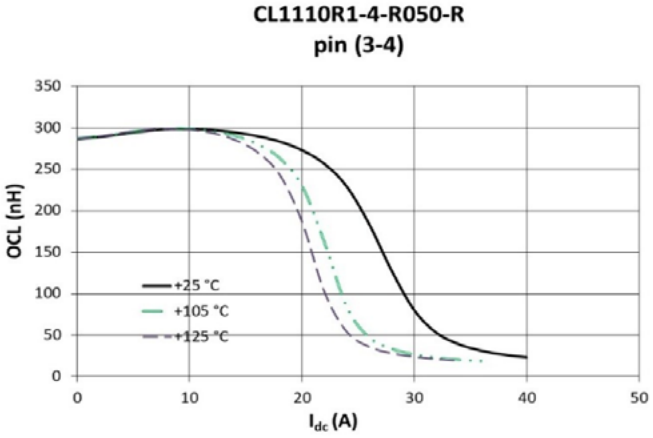
Inductance characteristics- SCL vs. current

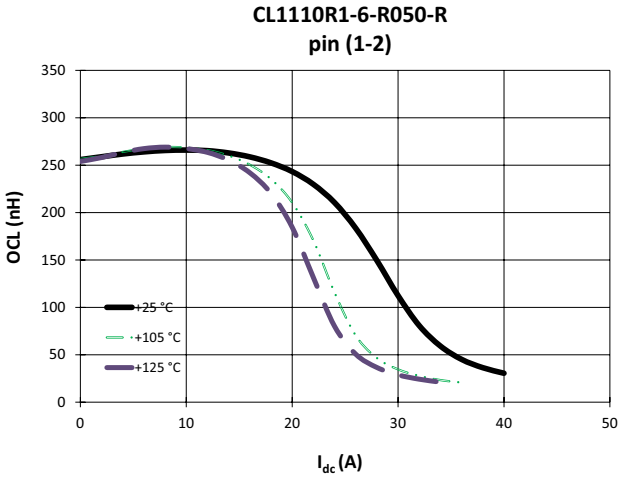


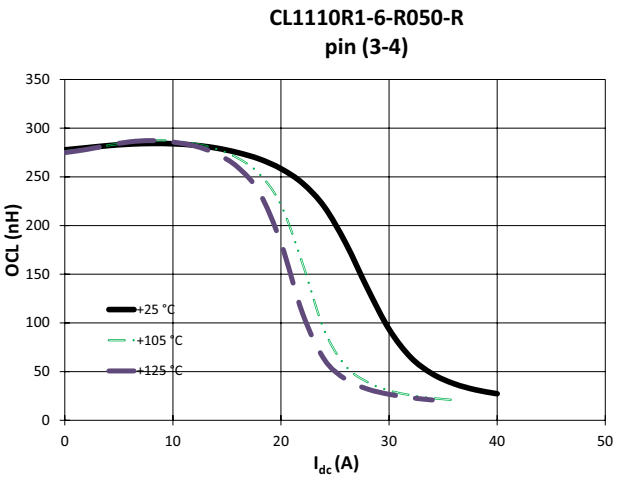


Inductance characteristics- OCL vs. current

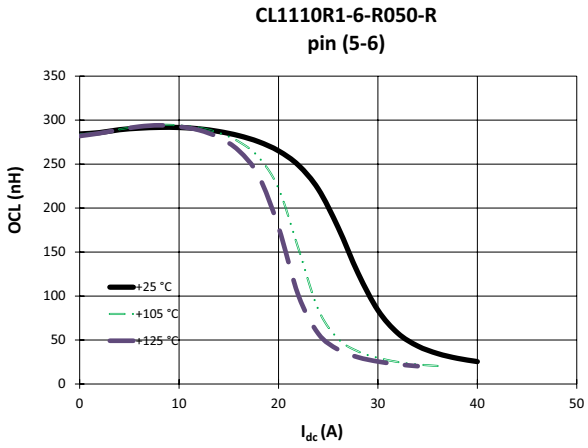




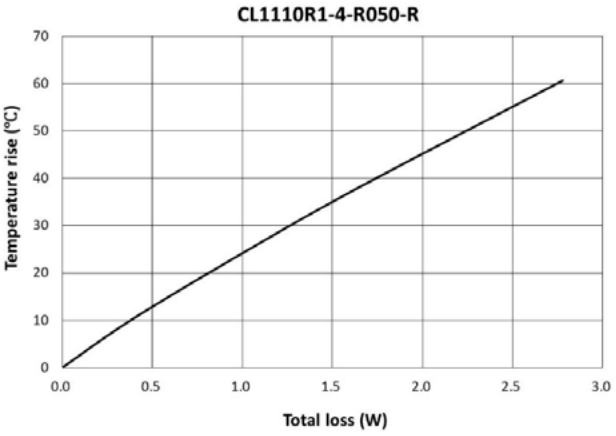


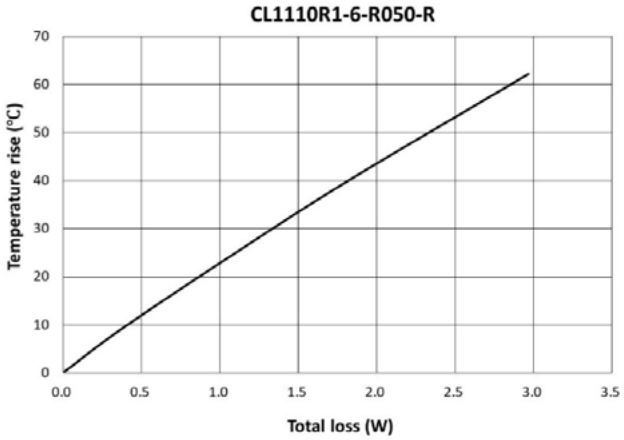


Inductance characteristics- OCL vs. current



Temperature rise vs total loss





Solder reflow profile

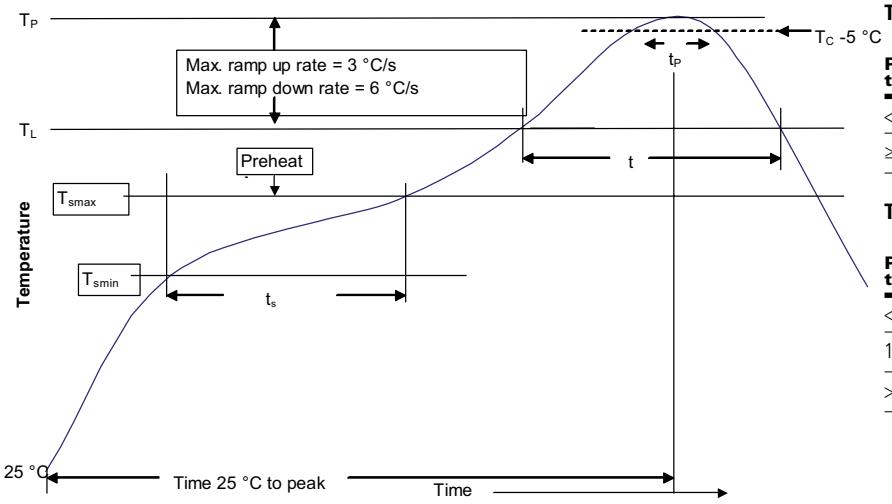


Table 1 - Standard SnPb solder (T_C)

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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Publication No. 11069 BU-MC20047
April 2020

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