TL1211V2

Trans-inductor regulator power inductor

Product features

- Operating frequency range: up to 3 MHz
- Ferrite core material
- 12 mm x 6.0 mm footprint surface mount package in an 11 mm height
- Inductance range: 70 nH to 200 nH
- Current range: 59 A to 170 A
- 100 Vdc insulation between windings
- Weight: 3.4 g typical
- Moisture sensitivity level (MSL): 1

Applications

- Multi-phase and Vcore regulators
- Voltage regulator modules (VRMs) and high power density VRMs
  - Server and desktop
  - Central processing unit (CPU)
  - Graphics processing unit (GPU)
  - Application specific integrated circuit (ASIC)
- Data networking and storage systems
- Graphics cards and battery power systems
- Point-of-Load modules

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

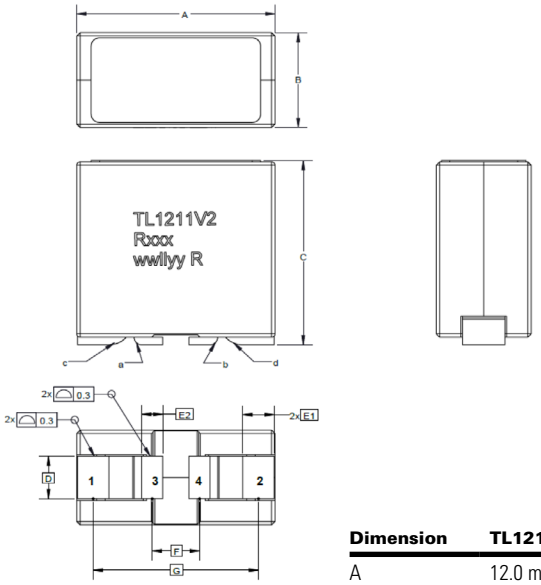
Powering Business Worldwide

Product specifications

Part number[9]	Lpri[1] (nH) ±10% (3-4)	Lsec[1] (nH) ±10% (1-2)	FLL[2] (nH) Minimum	I_{rms}_sec[3] (A)	$I_{sat}1$[4] (A)	$I_{sat}2$[5] (A)	$I_{sat}3$[6] (A)	K-factor[7]	DCR_pri (mΩ) @ +20 °C ±10%	DCR_sec (mΩ) @ +20 °C ±10%	Kps[8] Typical
TL1211V2-R070-R	70	70	50	75	170	145	135	328	0.37	0.125	0.93
TL1211V2-R080-R	80	80	57	75	149	127	119	328	0.37	0.125	0.93
TL1211V2-R100-R	100	100	72	75	119	102	95	328	0.37	0.125	0.95
TL1211V2-R110-R	110	110	79	75	108	92	86	328	0.37	0.125	0.95
TL1211V2-R120-R	120	120	86	75	99	84	79	328	0.37	0.125	0.95
TL1211V2-R150-R	150	150	108	75	79	67	63	328	0.37	0.125	0.96
TL1211V2-R170-R	170	170	122	75	70	60	56	328	0.37	0.125	0.96
TL1211V2-R200-R	200	200	144	75	59	50	47	328	0.37	0.125	0.96

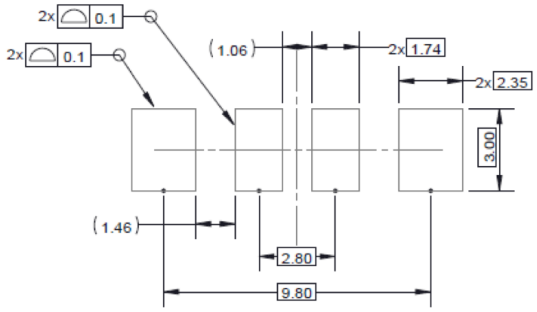
1. Open circuit inductance (OCL) test parameters: 100 kHz, 0.1 V_{rms}, 0.0 Adc, +25 °C
2. Full load inductance (FLL) test parameters: 100 kHz, 0.1 V_{rms}, $I_{sat}1$, +25 °C
3. I_{rms}: DC current for an approximate temperature rise of 40 °C without core loss. Derating is necessary for AC currents. 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. $I_{sat}2$: Peak current for approximately 20% rolloff @ +100 °C
6. $I_{sat}3$: Peak current for approximately 20% rolloff @ +125 °C
7. K-factor: Used to determine Bp-p for core loss (see graph). Bp-p = K * L * ΔI * 10^{-3}. Bp-p:(Gauss), K: (K-factor from table), L: (Inductance in nH), ΔI (Peak to peak ripple current in Amps).
8. Kps: Coupling Coefficient
9. Part number definition: TL1211V2-Rxxx-R
   TL1211 = Product code and size
   Vx= Version indicator
   Rxxx=Inductance value in µH, R=decimal point
   -R suffix = RoHS compliant

Dimensions-mm

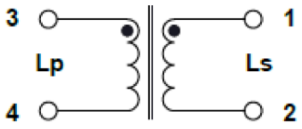


Dimension	TL1211V2-R
A	12.0 maximum
B	6.0 maximum
C	11.0 maximum
D	2.55
E1	1.8
E2	1.24
F	2.79
G	9.8

Recommended pad layout



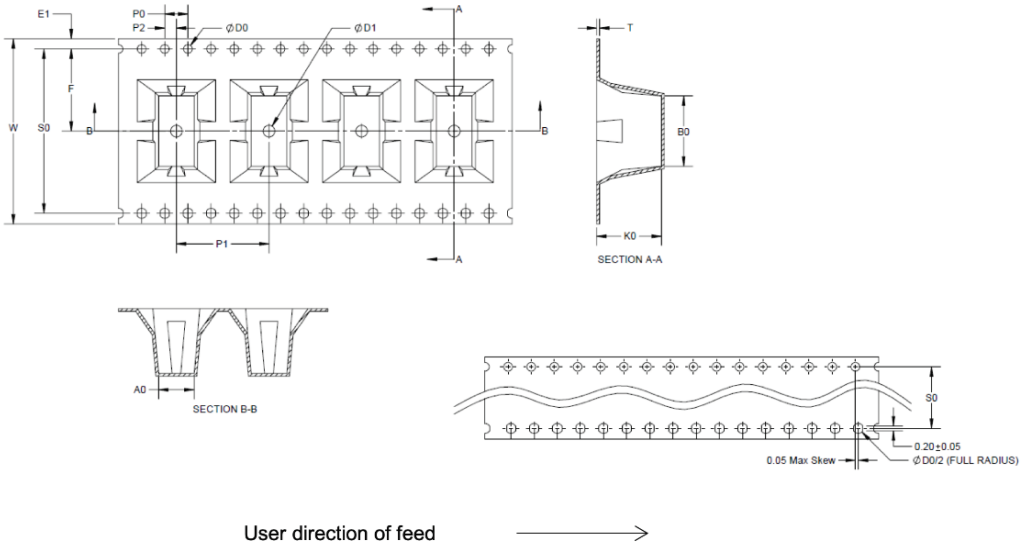
Schematic



Part marking: TL1211=Product code and size, Vx=Version indicator, Rxxx= inductance value in uH, R=decimal point, xxxx= lot code
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_pri is measured from point "a" to point "b"
DCR_sec is measured from point "a" to point "b"
Traces or vias underneath the inductor is not recommended
Dimensions of recommended PCB layout are reference only
Add 0.4 mm gap of pad 3 & 4 to avoid short cut issue

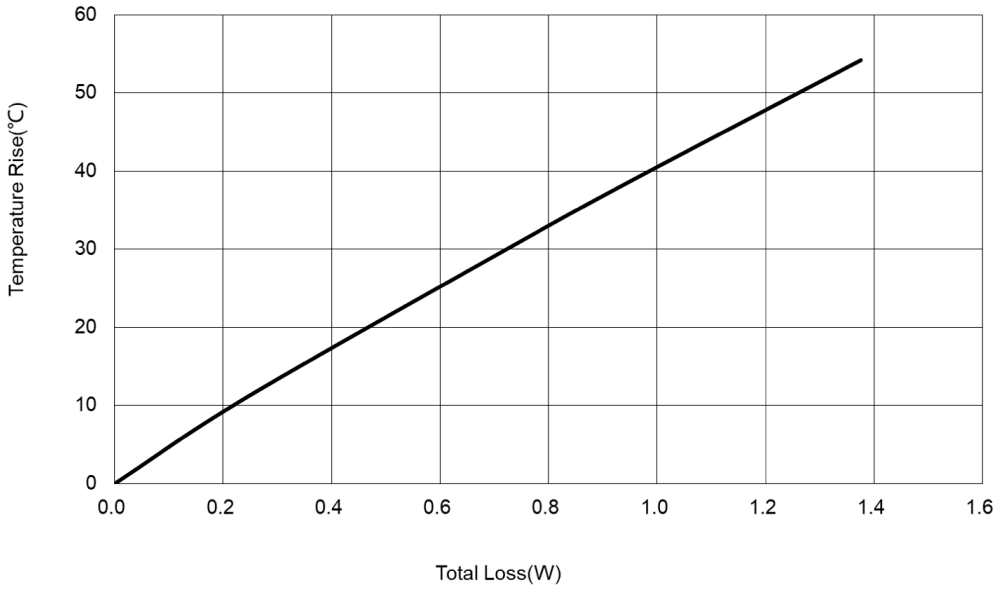
Packaging information- mm

Supplied in tape and reel packaging, 350 parts per 13" diameter reel (EIA-481 compliant)

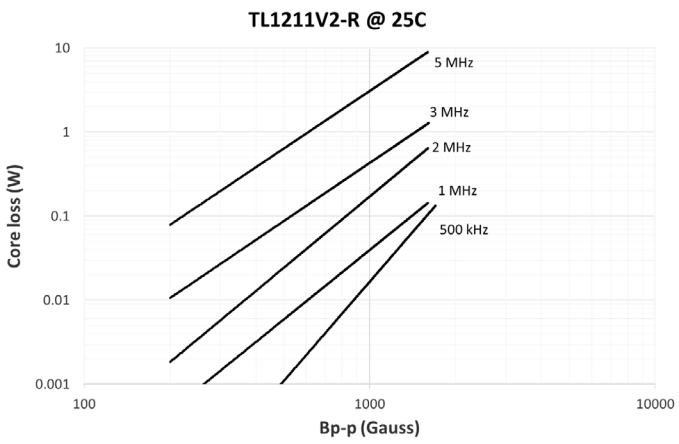


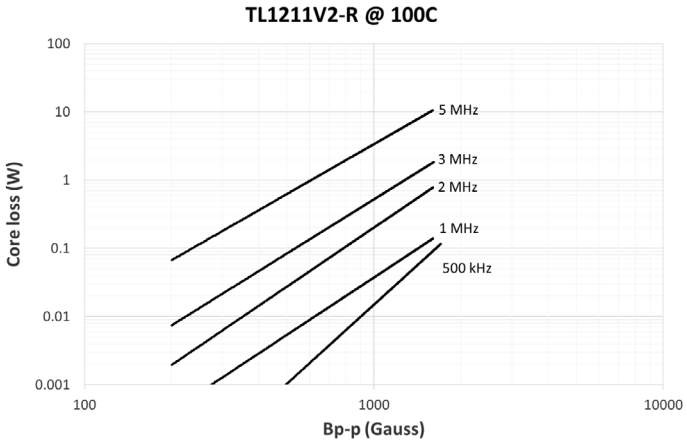
Item	Dimensions
W ± 0.30	32.00
F ± 0.10	14.20
E1 ± 0.10	1.75
E2 minimum	28.40
P0 ± 0.10	4.00
P1 ± 0.10	16.00
P2 ± 0.10	2.00
D0 + 0.10/-0	1.50
D1 minimum	2.00
A0 ± 0.10	6.15
B0 ± 0.10	12.15
K0 ± 0.10	11.20
T ± 0.05	0.50

Temperature rise vs. total loss

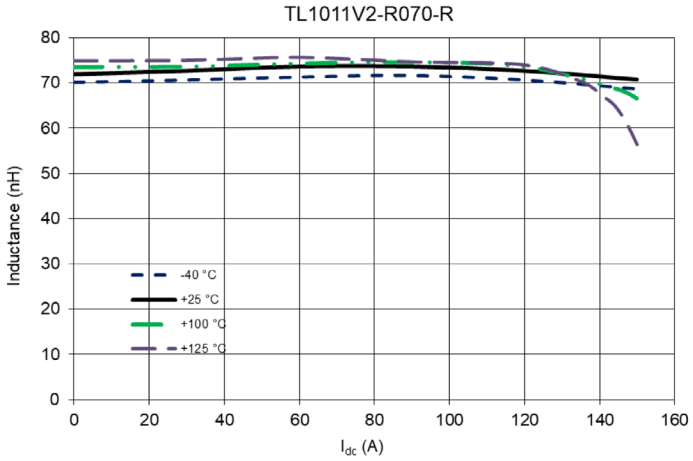


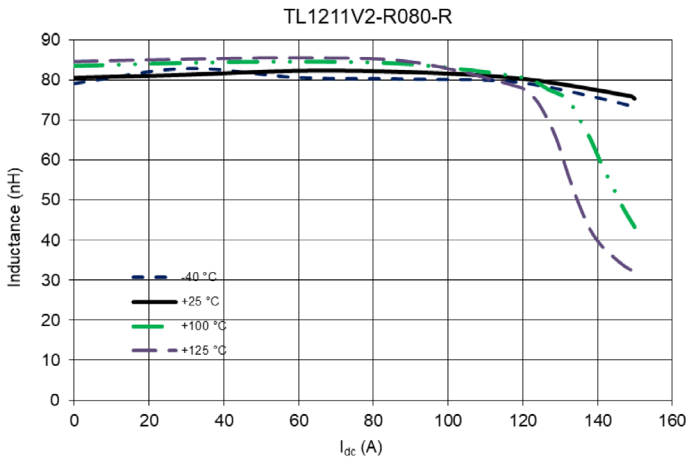
Core loss vs Bp-p

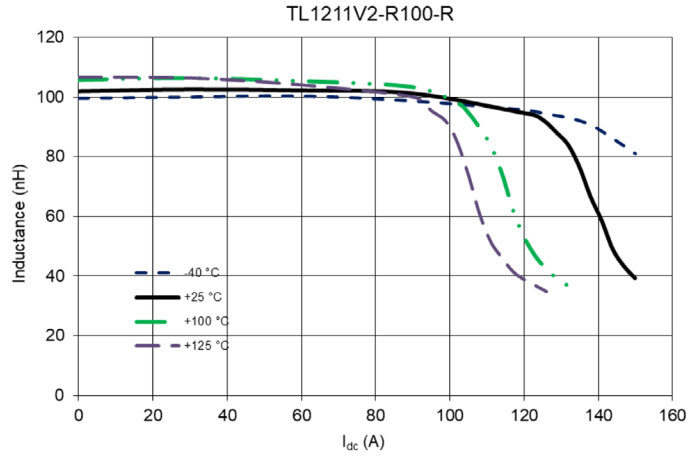


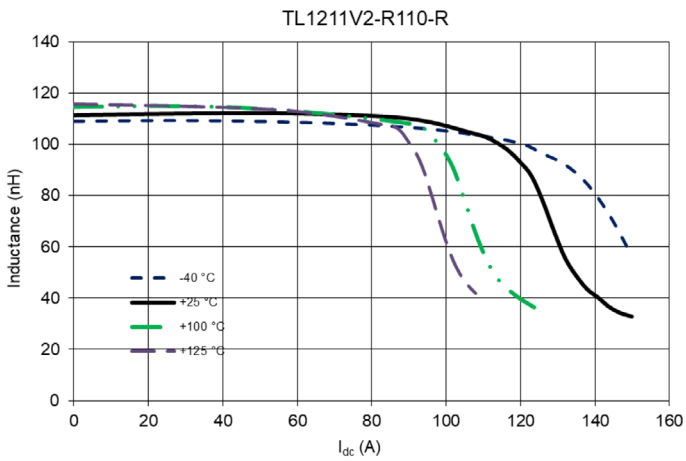


Inductance characteristics

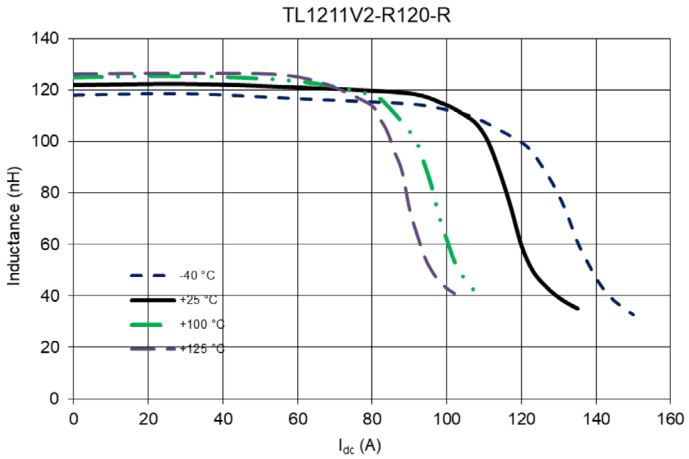


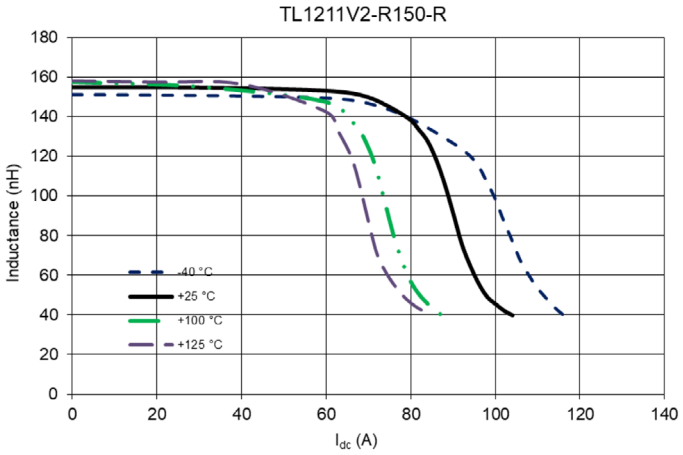


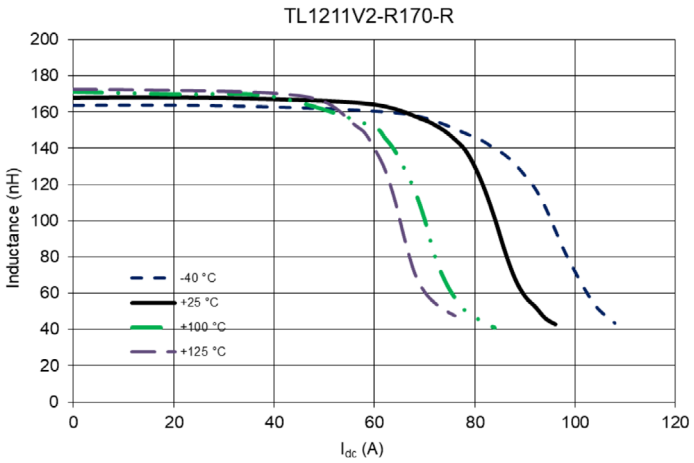


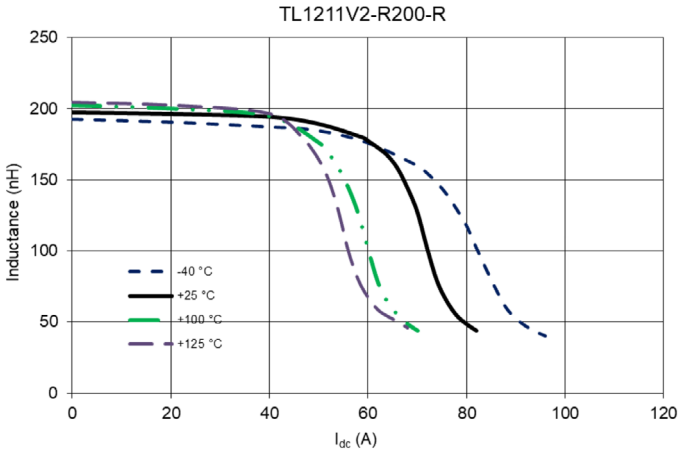


Inductance characteristics









Solder reflow profile

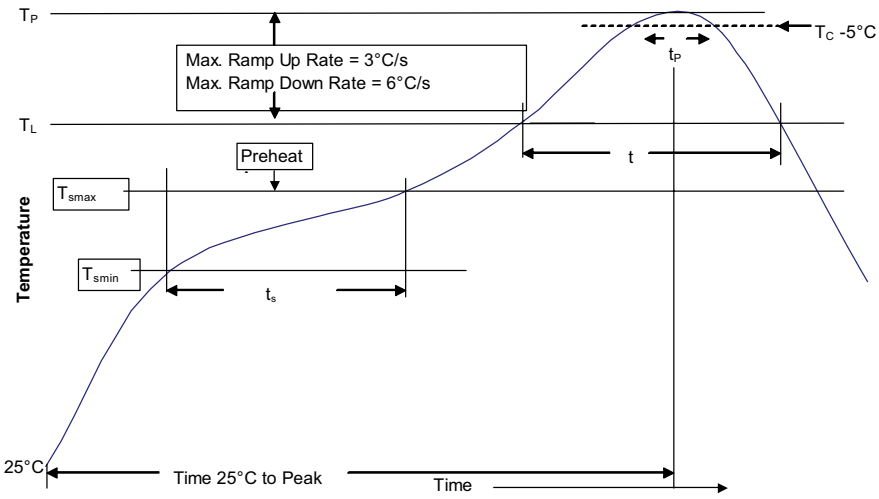


Table 1 - Standard SnPb solder (T_C)

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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