HPAL1V0630

High current inductor

Product features

- High current carrying capacity
- Low core losses
- Magnetically shielded, low EMI
- Inductance range from 0.15 µH to 10 µH
- Current range from 4.5 A to 40 A
- 7.3 mm x 6.8 mm footprint surface mount package in a 3.0 mm height
- Iron powder core material
- Moisture Sensitivity Level (MSL) 1

Applications

- Voltage Regulator Module (VRM)
- Multi-phase regulators
- Point-of-load modules (PoL)
- Desktop and server VRMs and EVRDs
- Base station equipment
- Notebook and laptop regulators
- Battery power systems
- Graphics cards
- Data networking and storage systems

Environmental compliance and general specifications

- Storage temperature range (Component): -55 °C to +125 °C
- Operating temperature range: -55 °C to +125 °C (ambient plus self-temperature rise)

Pb HALOGEN HF FREE RoHS

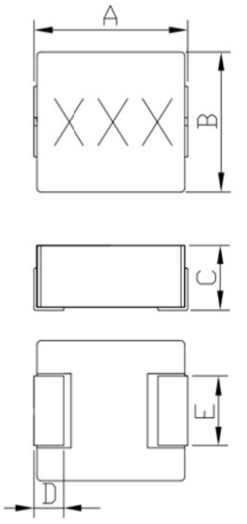
Powering Business Worldwide

Product specifications

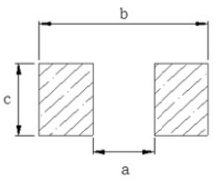
Part number[5]	OCL[1] (µH) ± 20%	FLL[2] (µH) minimum	I_{rms}[3] (A)	I_{sat}[4] (A)	DCR (mΩ) typical @ +20 °C	DCR (mΩ) maximum @ +20 °C
HPAL1V0630-R15-R	0.15	0.084	26	40	1.8	2.4
HPAL1V0630-R22-R	0.22	0.124	24	34	2.1	3.0
HPAL1V0630-R33-R	0.33	0.185	21	25	3.15	3.5
HPAL1V0630-R47-R	0.47	0.264	18	20	3.7	4.1
HPAL1V0630-R56-R	0.56	0.314	16.5	18	4.2	4.5
HPAL1V0630-R68-R	0.68	0.381	16	17	4.8	5.3
HPAL1V0630-R82-R	0.82	0.46	14	16	5.8	6.0
HPAL1V0630-1R0-R	1.0	0.56	12	15	6.8	7.4
HPAL1V0630-1R5-R	1.5	0.84	12	12	10	12.1
HPAL1V0630-2R2-R	2.2	1.24	9.5	10	12.5	15
HPAL1V0630-3R3-R	3.3	1.85	8.5	9.5	19	22
HPAL1V0630-4R7-R	4.7	2.64	6.0	9.0	28	33
HPAL1V0630-5R6-R	5.6	3.14	5.5	6.5	35	42
HPAL1V0630-6R8-R	6.8	3.81	5.0	6.0	42	48
HPAL1V0630-8R2-R	8.2	4.60	5.0	5.5	55	60
HPAL1V0630-100-R	10	5.60	4.5	5.5	61	68

1. Open circuit inductance (OCL) test parameters: 100 kHz, 1.0 V_{rms}, 0.0 Adc, +25 °C
2. Full load inductance (FLL) test parameters: 100 kHz, 1.0 V_{rms}, I_{sat}, , +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}: Peak current for approximately 30% rolloff @ +25 °C
5. Part Number Definition: HPAL1V0630-xxx-R
   HPAL1V0630 = Product code and size
   xxx=inductance value in all, "R" = decimal point, if no "R" is present, then third digit equals the number of zeros
   -R suffix = RoHS compliant

Dimensions (mm)



Recommended pad layout



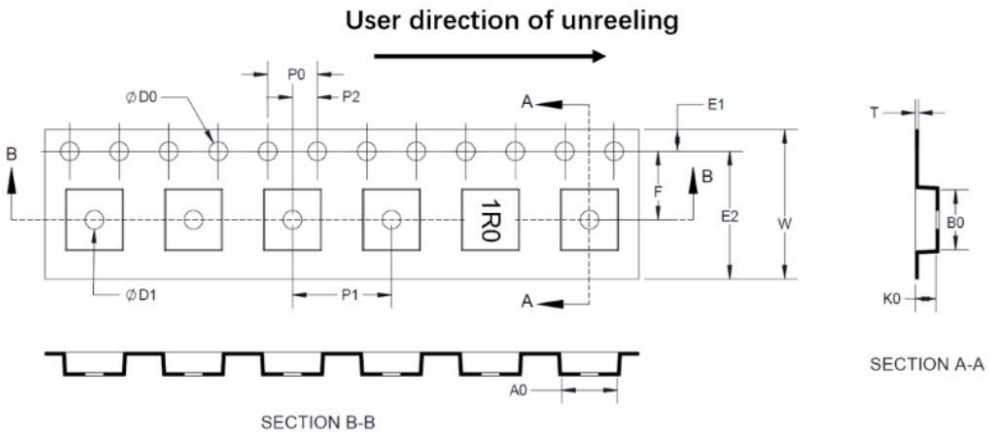
Part number	A	B	C	D	E	a	b	c
HPAL1V0630-xxx-R	7.0 ± 0.3	6.6 ± 0.2	2.8 ± 0.2	1.6 ± 0.3	3.0 ± 0.3	3.7 typ	8.4 typ	3.5 typ

Part marking: xxx=inductance value in uH, R=decimal point. If no R is present then last character equals number of zeros.
All soldering surfaces to be coplanar within 0.1 millimeters
Tolerances are ±0.3 millimeters unless stated otherwise
Pad layout tolerance is ±0.1 millimeters unless stated otherwise
Traces or vias underneath the inductor is not recommended

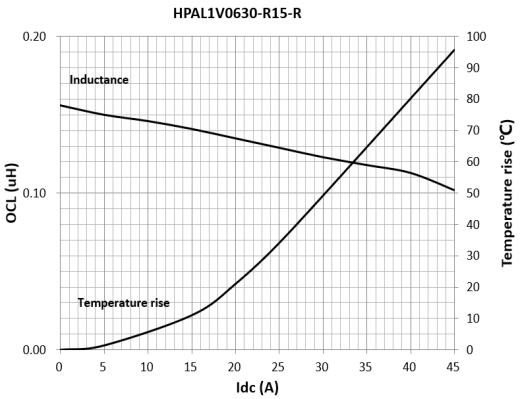
Packaging information (mm)

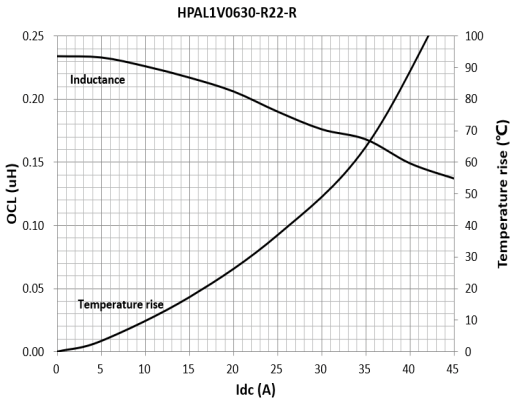
Supplied in tape and reel packaging, 1500 parts per 13" diameter reel

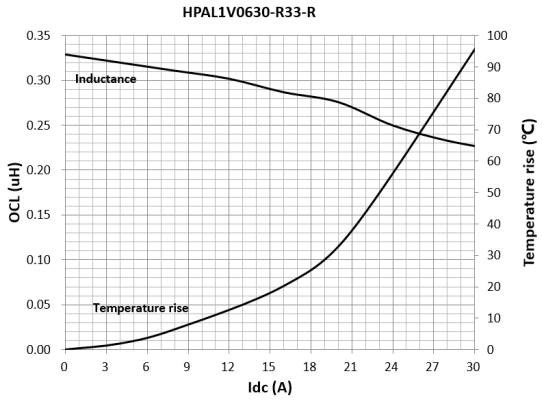
Eaton Family	HPAL1V0630
TR Carrier Size	16mm
W±0.30	16.00
F±0.10	7.50
E1±0.10	1.75
E2 Min	14.25
P0±0.10	4.00
P1±0.10	12.00
P2	2.0±0.10
D0+0.10/-0	1.50
D1+0.10/-0	1.50
A0±0.10	6.90
B0±0.10	7.50
K0±0.10	3.30
T±0.05	0.35

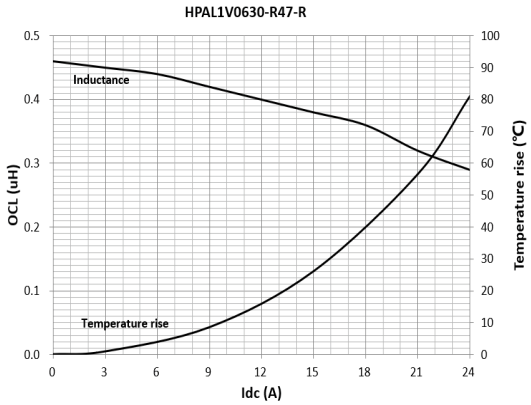


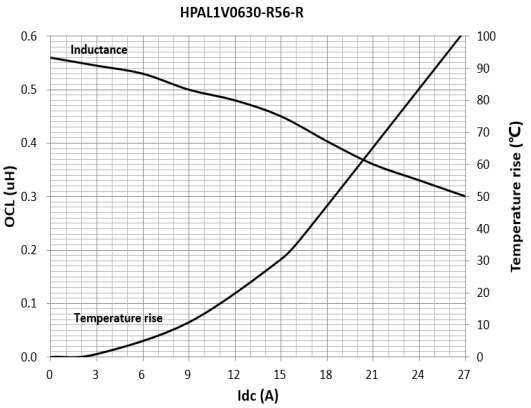
Inductance and temperature rise vs. Idc

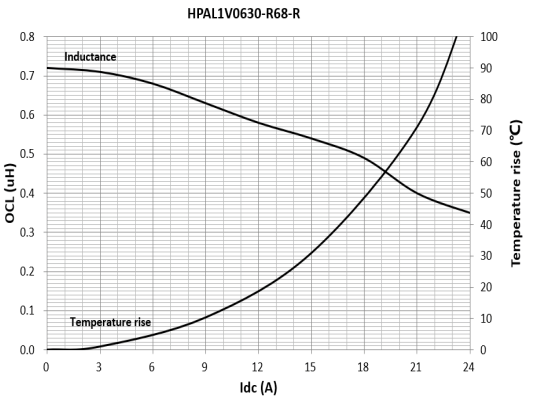












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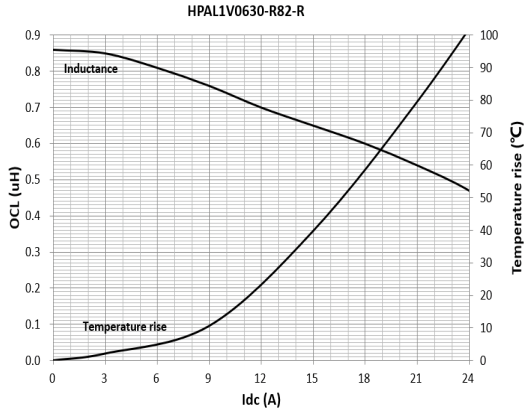

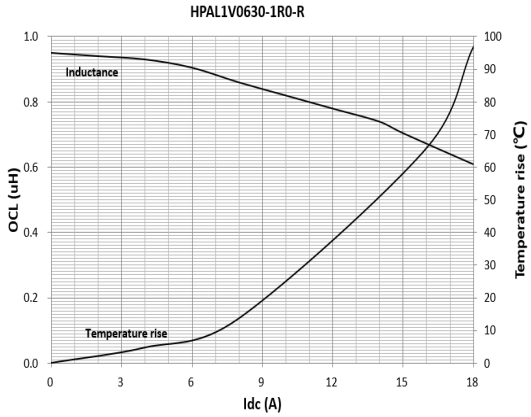

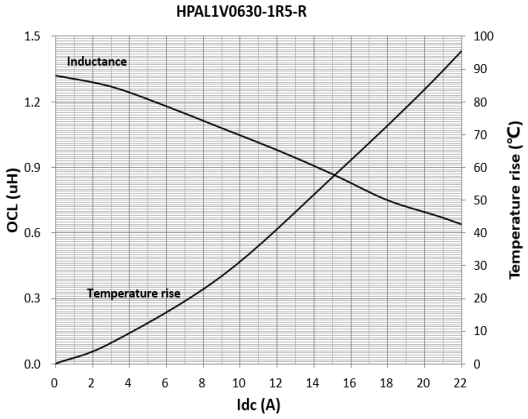

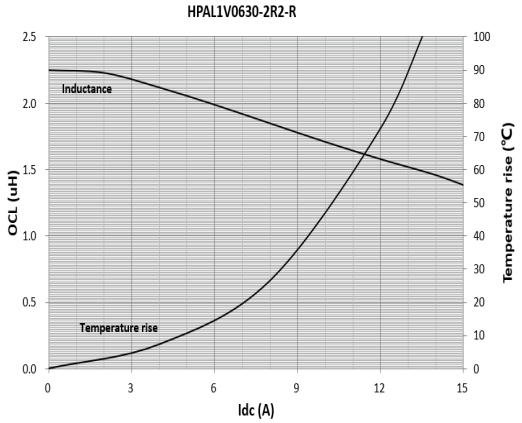

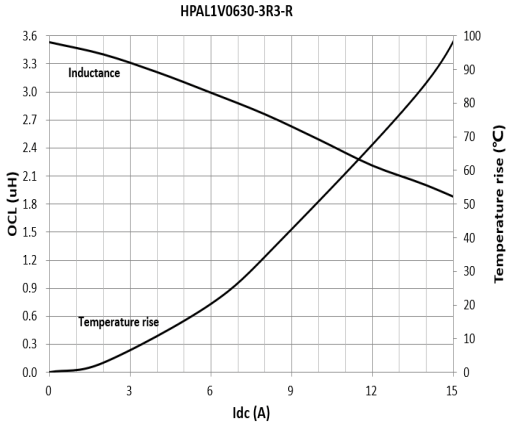

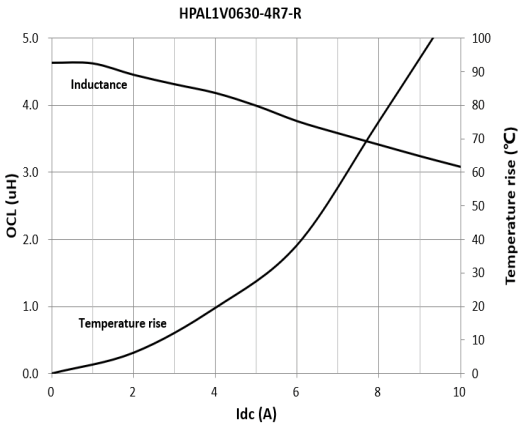

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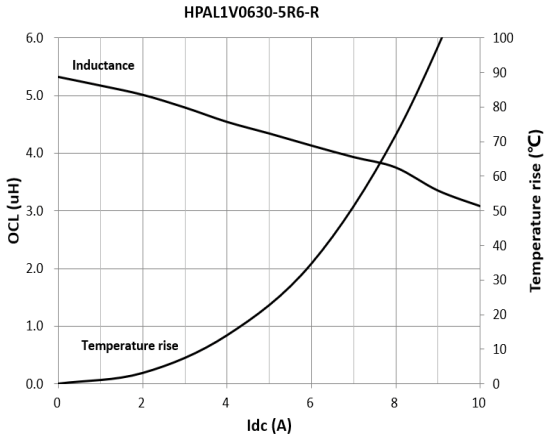

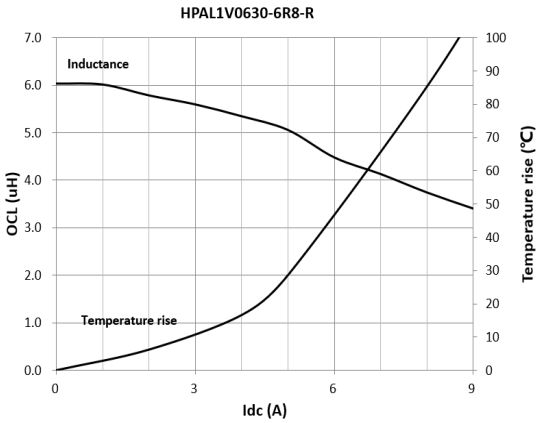

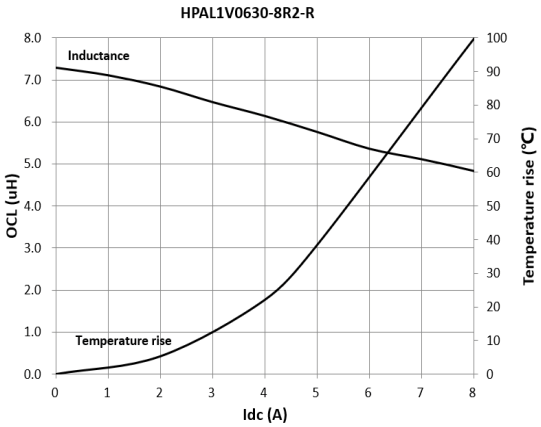

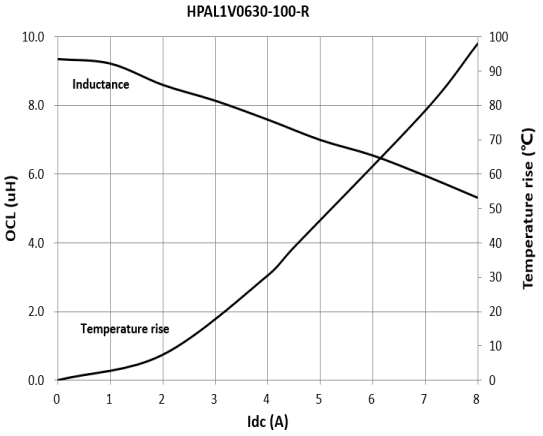

Solder reflow profile

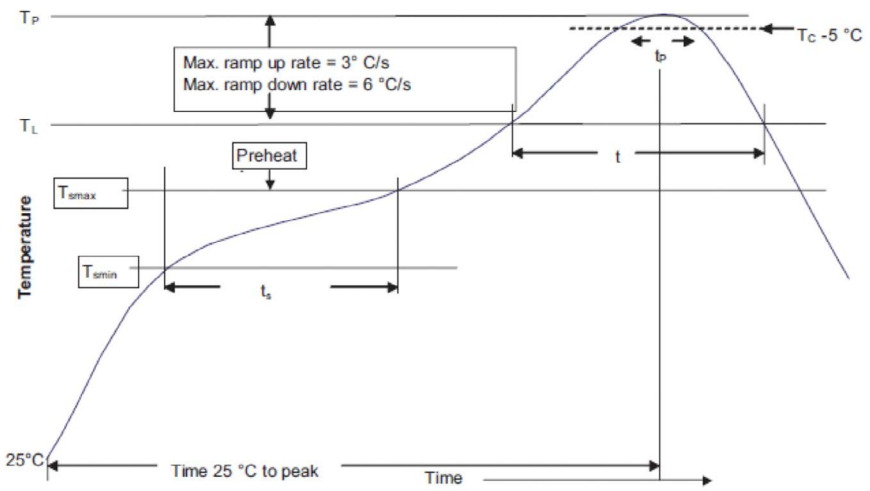

Table 1 - Standard SnPb solder (T_C)

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 (Tp)*		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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