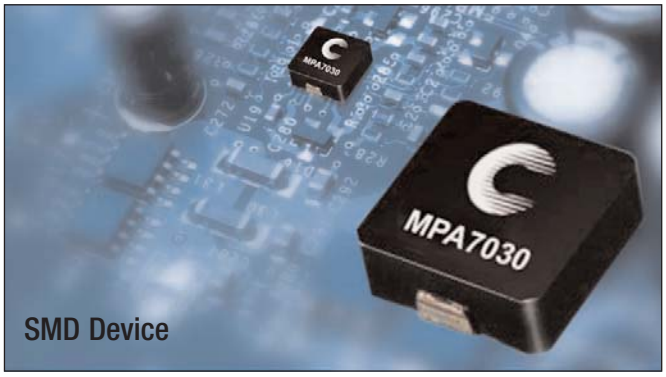
COILTRONICS®

High Frequency, High Current Power Inductors

MPA7030 Series



Description

- Halogen free
- 165°C maximum total temperature operation
- 7.6x7.0x3.0mm maximum surface mount package
- Magnetically shielded
- Rugged construction
- Handles high transient inrush current spikes
- Inductance Range from 1.5µH to 8.2µH
- Current range from 3.5 to 17.5 Amps
- RoHS compliant

Applications

- Automotive electronics (under the hood, interior/exterior)
- Voltage Regulator Module (VRM)
- Multi-phase regulators
- Point-of-load modules
- Desktop and server VRMs and EVRDs
- Base station equipment
- Notebook regulators
- POL Converters
- Battery power systems
- Data networking and storage
- Graphics cards
- LCD Displays, LED drivers

Environmental Data

- Storage temperature range: -55°C to +165°C
- Operating temperature range: -55°C to +165°C (ambient + self-temperature rise)
- Solder reflow temperature: J-STD-020D compliant
- Complies with AEC-Q200 standard

Packaging

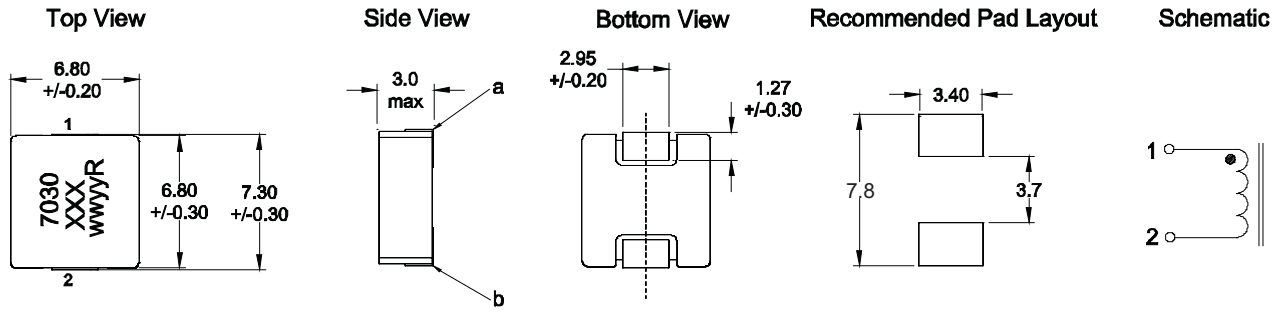
- Supplied in tape and reel packaging, 1500 parts per 13" reel

Product Specifications

Part Number[6]	OCL[1] ± 20% (µH)	I_{rms1}[2] (Amps)	I_{rms2}[3] (Amps)	I_{sat}[4] (Amps)	SRF (MHz) Minimum	DCR (mΩ) @20°C Typical	DCR (mΩ) @20°C Maximum	K-Factor[5]
MPA7030-1R5-R	1.5	9.20	7.60	17.5	37	13.5	14.9	174.6
MPA7030-2R2-R	2.2	7.70	6.30	11.0	28	19.6	22.0	145.8
MPA7030-3R3-R	3.3	6.20	5.40	11.0	19	26.0	28.1	124.7
MPA7030-4R7-R	4.7	5.50	4.70	9.50	15	36.5	40.0	104.8
MPA7030-6R8-R	6.8	4.50	3.80	7.50	12	55.0	60.5	84.4
MPA7030-8R2-R	8.2	4.00	3.50	8.00	10	64.5	71.0	74.8

1. Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.25V_{rms}, 0.0Adc
2. $I_{rms}1$: DC current for an approximate temperature rise of 40°C without core loss at 85°C ambient temperature. 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 165°C under worst case operating conditions verified in the end application.
3. $I_{rms}2$: DC current rating for for 125°C ambient temperature operation. 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 165°C under worst case operating conditions verified in the end application.
4. I_{sat}: Peak current for approximately 20% rolloff at +25°C (8R2 = 30%).
5. K-Factor: Used to determine B_{p-p} for core loss (see graph). $B_{p-p} = K * L * \Delta I$. B_{p-p}: (Gauss), K: (K-Factor from table), L: (Inductance in µH), ΔI (Peak-to-peak ripple current in amps).
6. Part Number Definition: MPA7030-xxx-R
   - MPA7030 = Product code and size
   - xxx= Inductance value in µH, R = decimal point. If no "R" is present, then third digit equals the number of zeros.
   - "-R" suffix = RoHS compliant

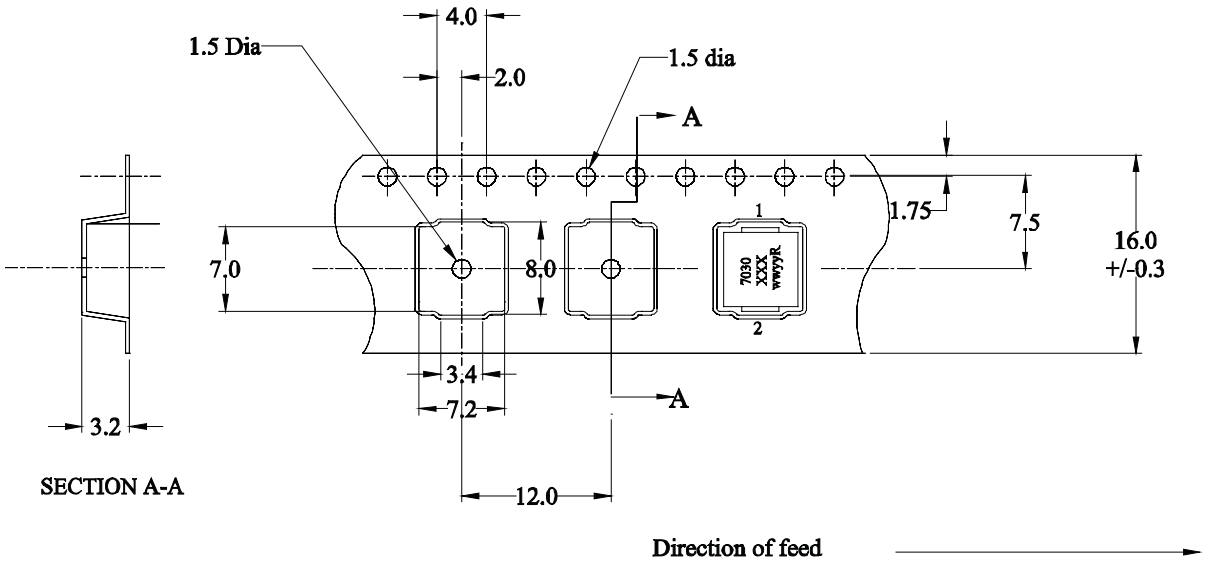
Dimensions - mm



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

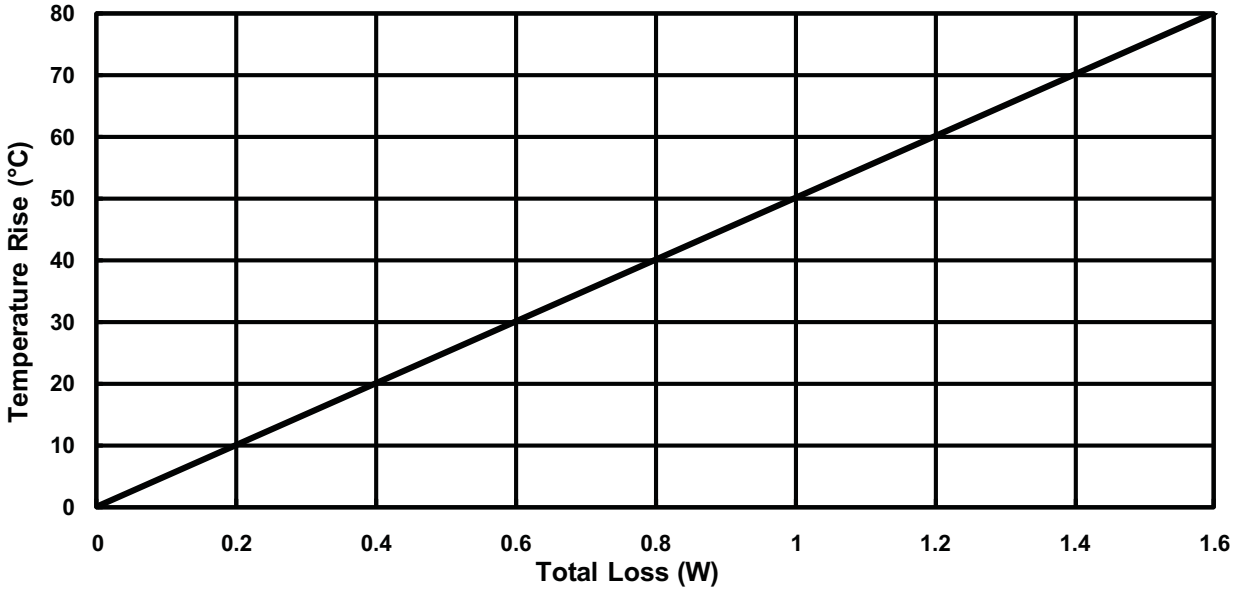
Part Marking: 7030= Size Code, XXX= Inductance value in uH, R=Decimal Point, If no R is present 3rd digit equals number of zeros, wwyy= Date Code, R= Revision Level
Tolerance are +/- 0.3 mm unless otherwise specified
Soldering surfaces to be coplanar within 0.10 mm

Packaging Information - mm

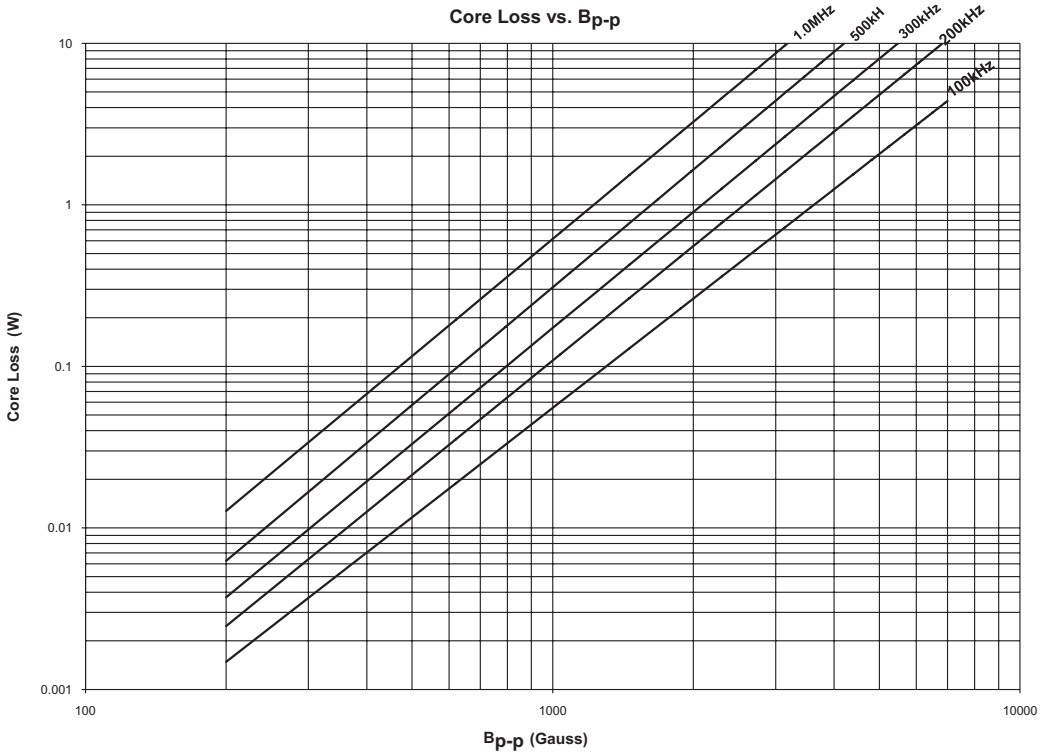


Supplied in tape and reel packaging, 1500 parts per 13" diameter reel.

Temperature Rise vs. Total Loss

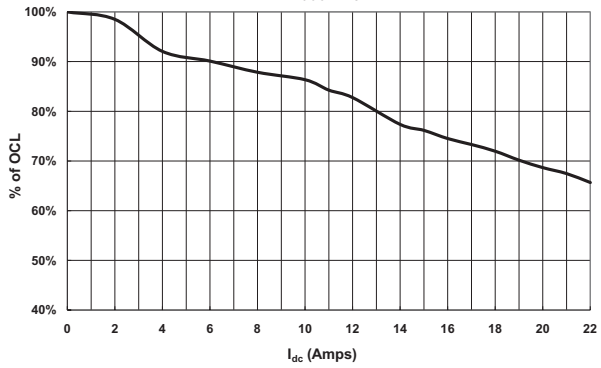


Core Loss

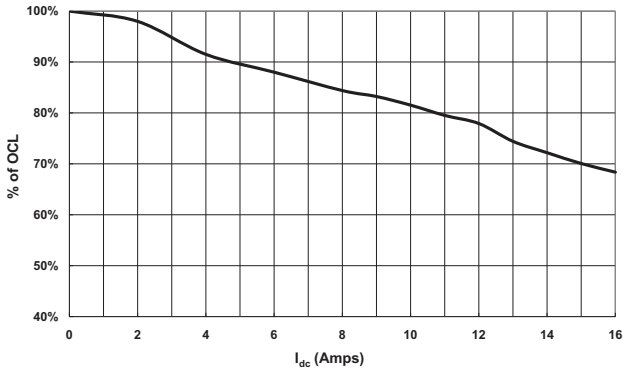


Inductance Characteristics - % of OCL vs. I_{DC}

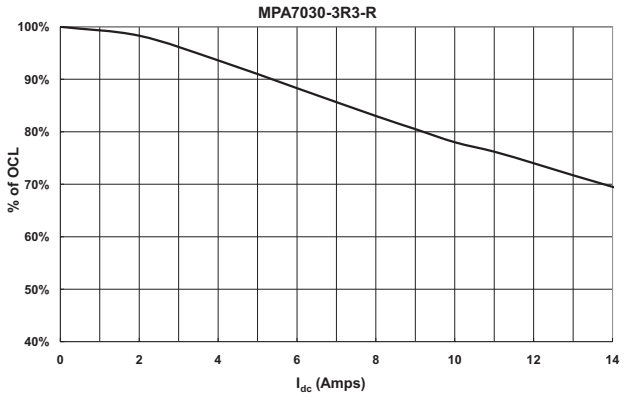
MPA7030-1R5-R



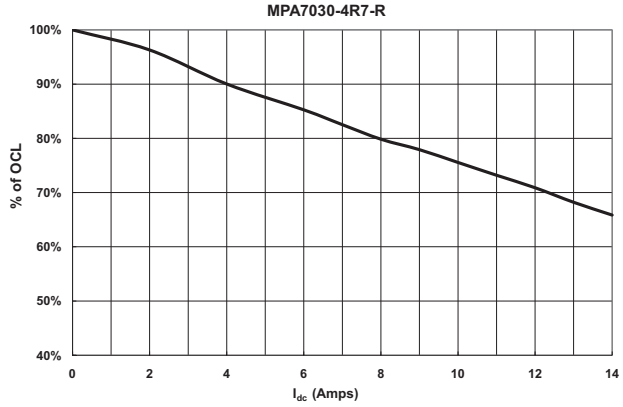
MPA7030-2R2-R



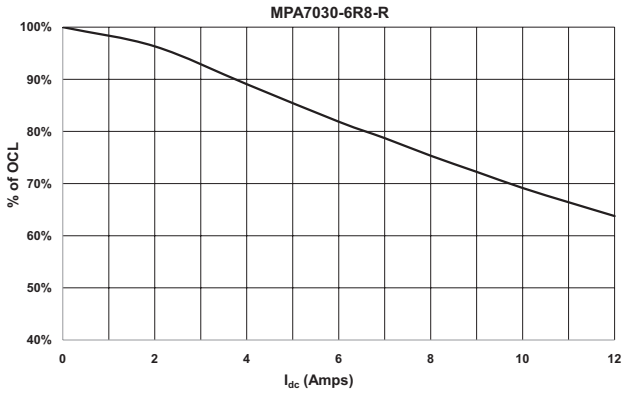
MPA7030-3R3-R



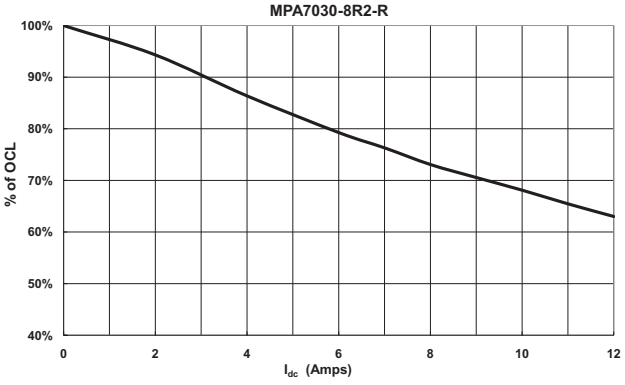
MPA7030-4R7-R



MPA7030-6R8-R



MPA7030-8R2-R



Solder Reflow Profile

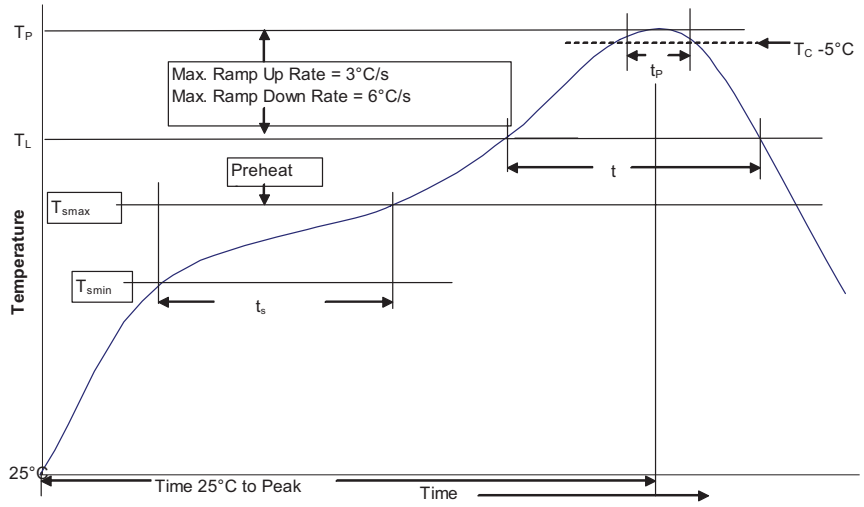


Table 1 - Standard SnPb Solder (T_C)

Package Thickness	Volume mm³ <350	Volume mm³ ≥350
<2.5mm	235°C	220°C
≥2.5mm	220°C	220°C

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

Package Thickness	Volume mm³ <350	Volume mm³ 350 - 2000	Volume mm³ >2000
<1.6mm	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) Time at liquidous (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**
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.

North America
Cooper Electronic Technologies
1225 Broken Sound Parkway NW
Suite F
Boca Raton, FL 33487-3533
Tel: 1-561-998-4100
Fax: 1-561-241-6640
Toll Free: 1-888-414-2645

Cooper Bussmann
P.O. Box 14460
St. Louis, MO 63178-4460
Tel: 1-636-394-2877
Fax: 1-636-527-1607

Europe
Cooper Electronic Technologies
Cooper (UK) Limited
Burton-on-the-Wolds
Leicestershire • LE12 5TH UK
Tel: +44 (0) 1509 882 737
Fax: +44 (0) 1509 882 786

Cooper Electronic Technologies
Avda. Santa Eulalia, 290
08223
Terrassa, (Barcelona), Spain
Tel: +34 937 362 812
+34 937 362 813
Fax: +34 937 362 719

Asia Pacific
Cooper Electronic Technologies
1 Jalan Kilang Timor
#06-01 Pacific Tech Centre
Singapore 159303
Tel: +65 278 6151
Fax: +65 270 4160