Large-Current Power Inductors MPCH

Overview

The KEMET MPCH metal composite inductors are designed for use in power supplies with ripple currents up to 32 A. These inductors offer superior permeability when compared to technologies based on ferrite cores.

The flat wire design allows for high efficiency under high current loads.

Applications

- Switching DC-DC power supplies
- Notebook computers
- Tablets
- Embedded computer systems
- Servers and storage
- HDTVs

Benefits

- Metal composite powder
- Operating temperature up to +125°C
- High current
- High permeability
- Low DCR
- Low acoustic noise

Part Number System

MPCH	0730	L	R12
Series	Size Code	Inductor	Inductance Code µH
MPCH	0730 0740 1040 1055 1060 1250		R = Decimal point Examples: R12 = 0.12 µH 1R3 = 1.30 µH

Performance Characteristics

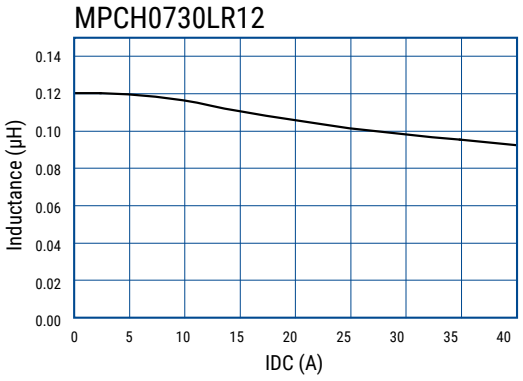
Item	Performance Characteristics
Operating Temperature	–40°C to +125°C (including self-temperature rise)
Rated Inductance Range	0.12 – 1.50 µH at 100 kHz, 1 mA
Inductance Tolerance	±20%
Rated DC Resistance Range	0.65 – 2.30 mΩ
DC Resistance Tolerance	±10%
Rated Current Range	17 – 32 A

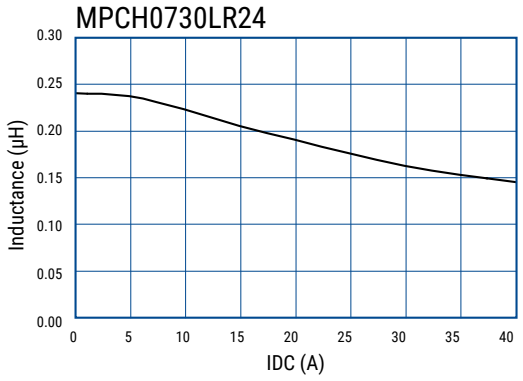
Table 1 – Ratings & Part Number Reference

Part Number	Inductance (µH) at 100 kHz, 1 mA	Inductance Tolerance	DC Resistance (mΩ) ±10%	Rated Current (A)	
				Irms[1] (Ref.)	Isat[2] (Ref.)
MPCH0730LR12	0.12	±20%	0.65	31.00	32.00
MPCH0730LR24	0.24	±20%	1.20	23.00	18.50
MPCH0740LR15	0.15	±20%	0.93	29.00	31.00
MPCH0740LR24	0.24	±20%	0.96	27.00	20.00
MPCH0740LR36E*	**0.36**	**±20%**	**1.42**	**23.00**	**22.00**
MPCH1040LR36	0.36	±20%	0.88	28.00	24.00
MPCH1040LR68	0.68	±20%	1.35	22.00	24.00
MPCH1040L1R0	1.00	±20%	2.30	17.00	17.00
MPCH1055L1R3	1.30	±20%	2.30	18.50	17.00
MPCH1060LR45	0.45	±20%	0.76	32.00	32.00
MPCH1250L1R5	1.50	±20%	2.20	21.00	21.00

[1] *T = 40 K rise at rated current*
[2] *Inductance drop 20% at rated current*
All electrical characteristics data is referenced to 20°C.
**** This part is not for new design.***

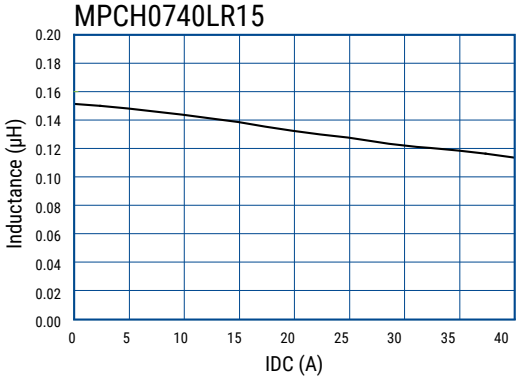
DC-Superposed Characteristics



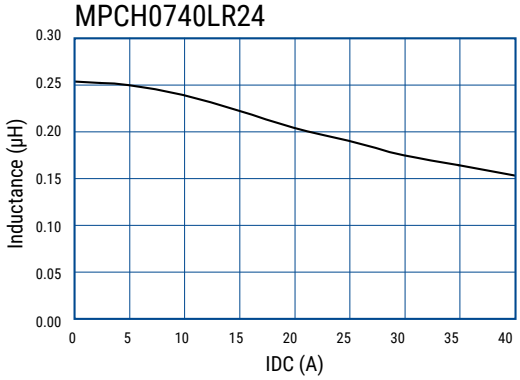


DC-Superposed Characteristics cont'd

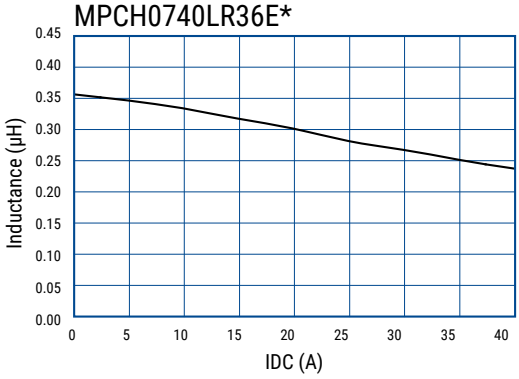
MPCH0740LR15



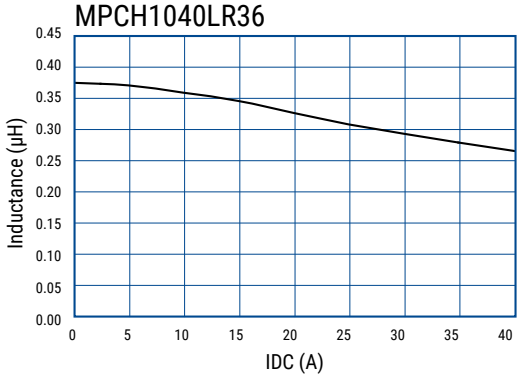
MPCH0740LR24



MPCH0740LR36E*

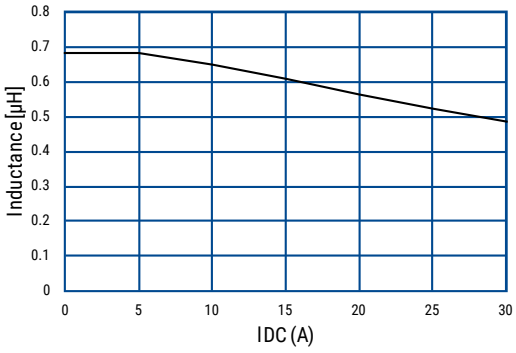


MPCH1040LR36



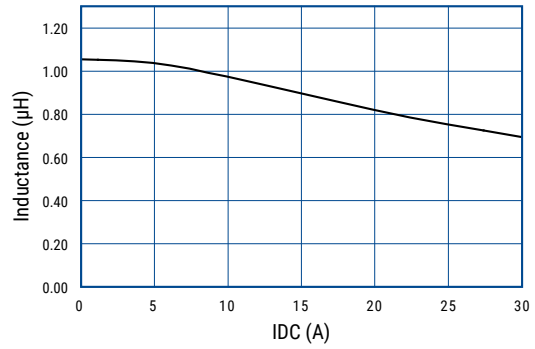
**** This part is not for new design.***

MPCH1040LR68

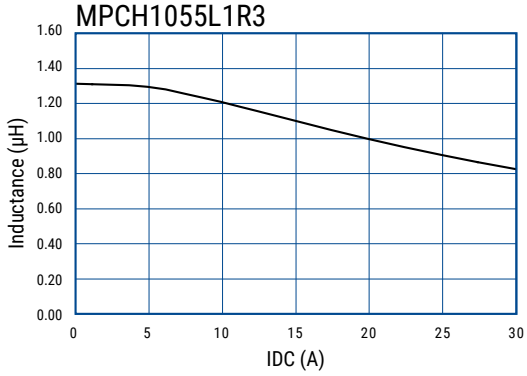


DC-Superposed Characteristics cont'd

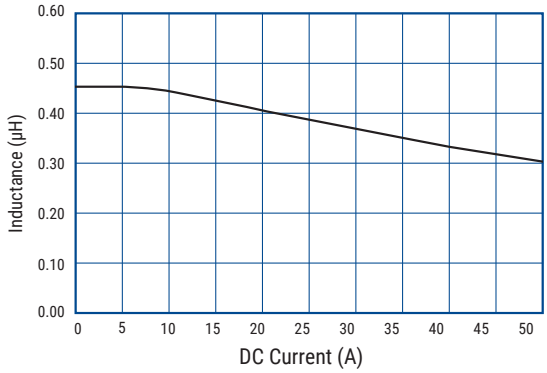
MPCH1040L1R0



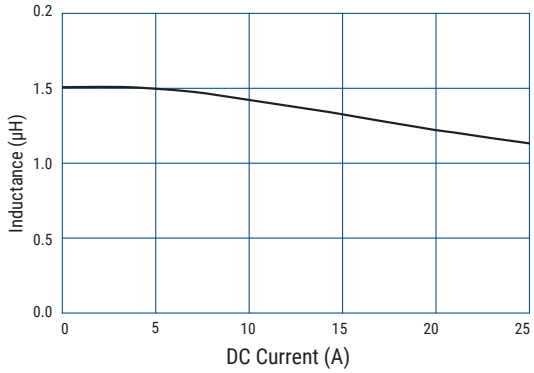
MPCH1055L1R3



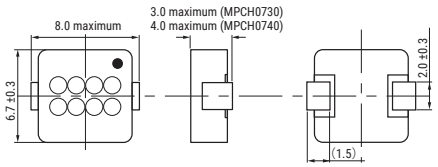
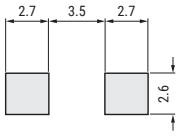
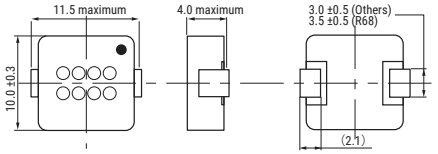
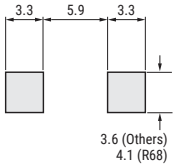
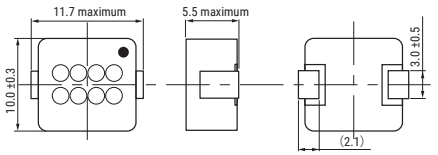
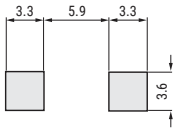
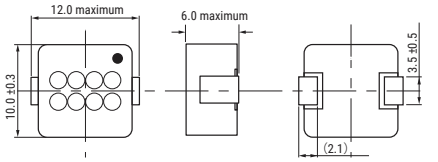
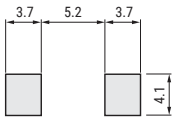
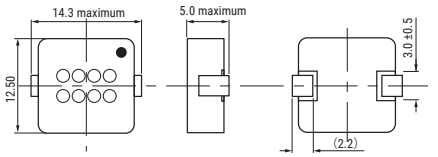
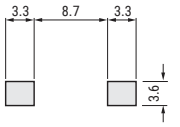
MPCH1060LR45



MPCH1250L1R5

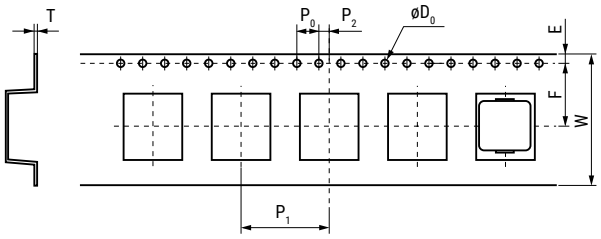


Dimensions

Case Size	Dimensions (mm)	Land Pattern (mm)
MPCH0730 MPCH0740		
MPCH1040		
MPCH1055		
MPCH1060		
MPCH1250		

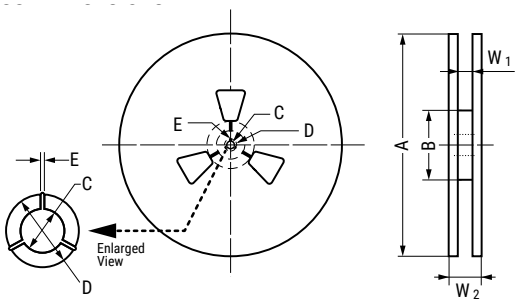
Taping Specification

Dimensions of Indented Square Hole Plastic Tape



Case Size	Reel Quantity		Dimensions (mm)							
			W	F	E	P_1	P_2	P_0	$øD_0$	T
MPCH0730 MPCH0740	1,000	Tolerance	±0.2	±0.1	±0.1	±0.1	±0.1	±0.1	±0.05	±0.05
		Nominal	16.0	7.5	1.75	12.0	2.0	4.0	1.55	0.4
MPCH1040	1,000	Tolerance	±0.3	±0.1	±0.1	±0.1	±0.1	±0.1	±0.05	±0.05
		Nominal	24.0	11.5	1.75	16.0	2.0	4.0	1.55	0.4
MPCH1055	500	Tolerance	±0.2	±0.1	±0.1	±0.1	±0.1	±0.1	±0.05	±0.05
		Nominal	24.0	11.5	1.75	24.0	2.0	4.0	1.55	0.4
MPCH1060		Tolerance	±0.2	±0.1	±0.1	±0.1	±0.1	±0.1	±0.05	±0.05
		Nominal	24.0	11.5	1.75	24.0	2.0	4.0	1.55	0.4
MPCH1250		Tolerance	±0.2	±0.1	±0.1	±0.1	±0.1	±0.1	±0.05	±0.05
		Nominal	24.0	11.5	1.75	24.0	2.0	4.0	1.55	0.4

Reel Specifications



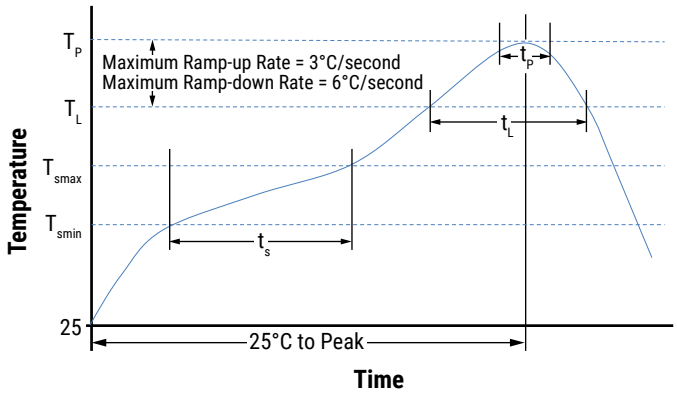
Case Size		Dimensions (mm)						
		A	B	C	D	E	W_1	W_2
MPCH0730, MPCH0740	Tolerance	±2.0	±1.0	±0.5	±0.8	±0.5	±1.0	±1.0
	Nominal	ø330	ø80	ø13.0	ø21.0	2.0	17.5	21.5
MPCH1040	Tolerance	±2.0	±1.0	±0.5	±0.8	±0.5	±2.0	±3.0
	Nominal	ø380	ø80	ø13.0	ø21.0	2.0	24.4	30.4
MPCH1055 MPCH1060 MPCH1250	Tolerance	±2.0	±1.0	±0.5	±0.8	±0.5	±2.0	±3.0
	Nominal	ø380	ø100	ø13.0	ø21.0	2.0	24.4	30.4

Soldering Process

Recommended Reflow Soldering Profile

Reference ICP/JEDEC J-STD-020E

Profile Feature	Pb-Free Assembly
Preheat/Soak	
Temperature Minimum (T_{Smin})	150°C
Temperature Maximum (T_{Smax})	200°C
Time (t_s) from T_{smin} to T_{smax}	60 – 120 seconds
Ramp-up Rate (T_L to T_P)	3°C/second maximum
Liquidous Temperature (T_L)	217°C
Time Above Liquidous (t_L)	60 – 150 seconds
Peak Temperature (T_P)	250°C for MPCH07xx 245°C for MPCH1xxx
Time within 5°C of Maximum Peak Temperature (t_P)	30 seconds maximum
Ramp-down Rate (T_P to T_L)	6°C/second maximum
Time 25°C to Peak Temperature	8 minutes maximum



Environmental Compliance

All KEMET SMD Inductors are RoHS compliant.

Handling Precautions

Inductors should be stored in normal working environments. While the inductors themselves are quite robust in other environments, solderability will be degraded by exposure to high temperatures, high humidity, corrosive atmospheres, and long term storage.

KEMET recommends that maximum storage temperature not exceed 40°C and maximum storage humidity not exceed 70% relative humidity. Atmospheres should be free of chlorine and sulfur bearing compounds. Temperature fluctuations should be minimized to avoid condensation on the parts.

For optimized solderability, inductors' stock should be used promptly, preferably within six months of receipt.

Export Control

For customers in Japan
For products which are controlled items subject to the “Foreign Exchange and Foreign Trade Law” of Japan, the export license specified by the law is required for export.

For customers outside Japan
Inductors should not be used or sold for use in the development, production, stockpiling or utilization of any conventional weapons or mass-destruction weapons (nuclear, chemical, biological weapons or missiles), or any other weapons.

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Although all product–related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicated or that other measures may not be required.

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MPCH0740LR15 MPCH0730LR12 MPCH1040LR36 MPCH1060LR45 MPCH1250L1R5 MPCH0730LR24 MPCH0740LR24 MPCH0740LR36E MPCH0740LR26 MPCH1055L1R3 MPCH1040L1R0