Power Choke Coil (Automotive Grade)

Series: **PCC-M0530M-LP(MC)**
PCC-M0630M-LP(MC)
PCC-M0840M-LP(MC)
PCC-M1040M-LP(MC)



High heat resistance and high reliability
Using metal composite core (MC)

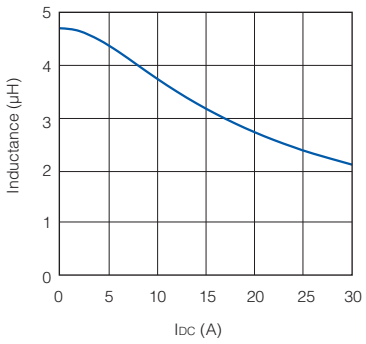
Industrial Property : patents 3 (Registered 2/Pending 1)

Features

- High heat resistance : Operation up to 155 °C including self-heating
- Low profile : 3 mm max. height (PCC-M0530M-LP, PCC-M0630M-LP)
  4 mm max. height (PCC-M0840M-LP, PCC-M1040M-LP)
- SMD type
- High-reliability : High vibration resistance as result of newly developed integral construction; under severe reliability conditions of automotive and other strenuous applications
- High bias current : Excellent inductance stability using ferrous alloy magnetic material (Fig.1)
- Temp. stability : Excellent inductance stability over broad temp. range
- Low audible (buzz) noise : A gapless structure achieved with metal composite core
- High efficiency : Low DC resistance of winding and low eddy-current loss of the core
- Shielded construction
- AEC-Q200 Automotive qualified
- RoHS compliant

● Fig.1 Inductance v.s. DC current

ETQP4M4R7KVC(reference)



Recommended Applications

- Noise filter for various drive circuitry requiring high temp. operation and peak current handling capability
- Boost-Converter, Buck-Converter DC/DC

Standard Packing Quantity (Minimum Quantity/Packing Unit)

- 4,000 pcs/box (2 reel) : PCC-M0530M-LP, PCC-M0630M-LP
- 1,000 pcs/box (2 reel) : PCC-M0840M-LP, PCC-M1040M-LP

Explanation of Part Numbers

1	2	3	4	5	6	7	8	9	10	11	12
E	T	Q	P		M				K	V	
Product Code			Classification	Height	Winding	Inductance			Core	Suffix	Size

Inductance	
4R7→	4.7 µH
220→	22 µH
R68→	0.68 µH

Size	
P	□ 5 mm size
N	□ 6 mm size
K	□ 8 mm size
C	□10 mm size

Temperature rating

Operating temperature range		Tc : –55 °C to +155 °C(Including self-temperature rise)
Storage condition	After PWB mounting	
	Before PWB mounting	Ta : –5 °C to +35 °C 85%RH max.

1. Series PCC-M0530M-LP (ETQP3M□□□KVP)

Standard Parts

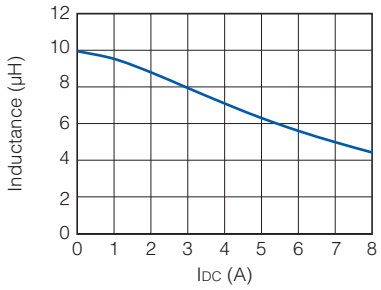
Part No.	Inductance *1		DCR (at 20 °C) (mΩ)		Rated Current (Typ. : A)			Series
	L0 (μH)	Tolerance (%)	Typ. (max.)	Tolerance (%)	ΔT=40K (*2)	ΔT=40K (*3)	ΔL=–30% (*4)	
ETQP3M100KVP	10.00	±20	96.00 (105.60)	±10	2.4	2.9	4.2	PCC-M0530M-LP [5.5×5.0×3.0(mm)]
ETQP3M6R8KVP	6.80		65.70 (72.27)		2.9	3.5	6.1	
ETQP3M4R7KVP	4.70		45.60 (50.16)		3.4	4.1	6.7	
ETQP3M3R3KVP	3.30		27.30 (30.03)		4.4	5.4	8.0	
ETQP3M2R2KVP	2.20		20.00 (22.00)		5.2	6.3	10.1	
ETQP3M1R5KVP	1.50		12.00 (13.20)		6.7	8.1	12.0	
ETQP3M1R0KVP	1.00		9.60 (10.56)		7.5	9.0	14.1	
ETQP3MR68KVP	0.68		7.60 (8.36)		8.4	10.2	15.9	
NEW ETQP3MR33KVP	0.33		4.85 (5.34)		10.6	12.7	21.8	

(*1) Measured at 100k Hz.
(*2) DC current which causes temperature rise of 40K. Parts are soldered by reflow on four-layer PWB (1.6 mm FR4) and measured at room temperature. See also (*5)
(*3) DC current which causes temperature rise of 40K. Parts are soldered by reflow on multilayer PWB with high heat dissipation performance. Note: Heat radiation constant are approx. 51 K/W measured on 5.5×5.0×3.0 mm case size. See also (*5)
(*4) Saturation rated current : DC current which causes L(0) drop –30 %.
(*5) Within a suitable application, the part's temperature depends on circuit design and certain heat dissipation conditions. This should be double checked in a worst case operation mode.
In normal case, the max.standard operating temperature of +155 °C should not be exceeded.
For higher operating temperature conditions, please contact Panasonic representative in your area.

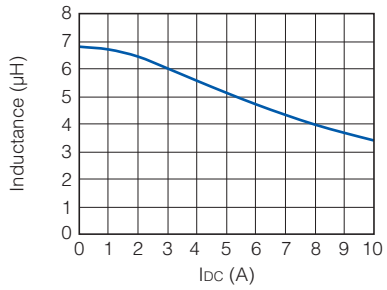
Performance Characteristics (Reference)

● Inductance vs DC Current

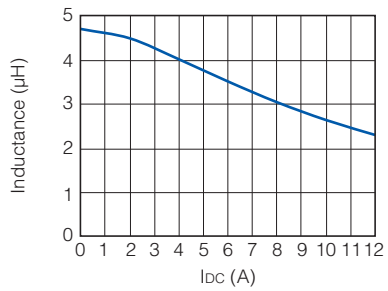
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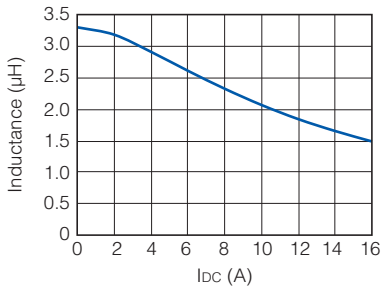
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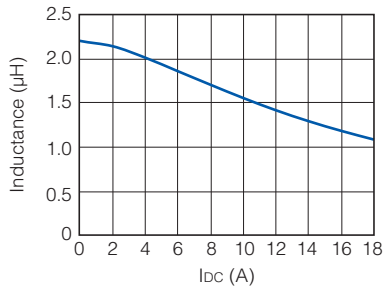
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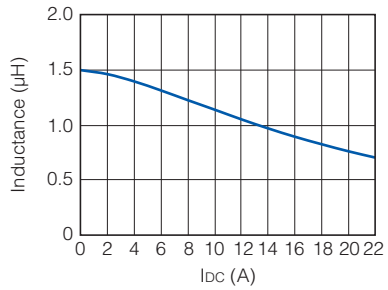
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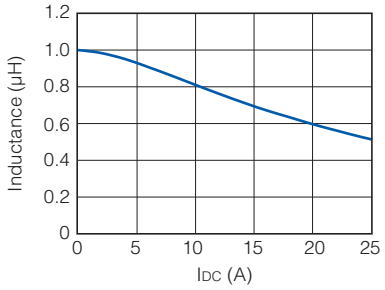
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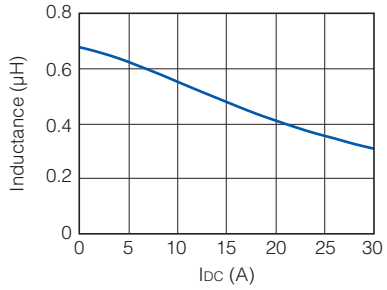
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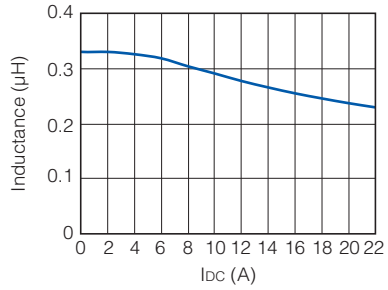
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ETQP3MR68KVP



ETQP3MR33KVP

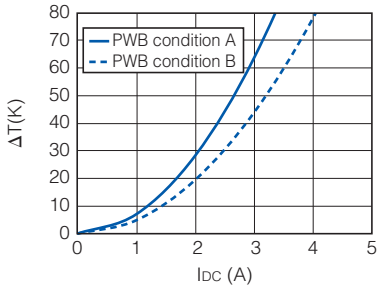


Performance Characteristics (Reference)

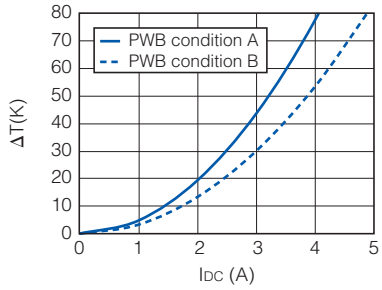
● Case Temperature vs DC Current

PWB condition A : Four-layer PWB (1.6 mm FR4), See also (*2)
PWB condition B : Multilayer PWB with high heat dissipation performance. See also (*3)

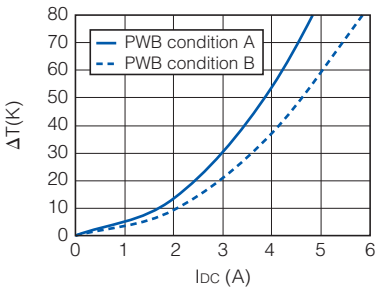
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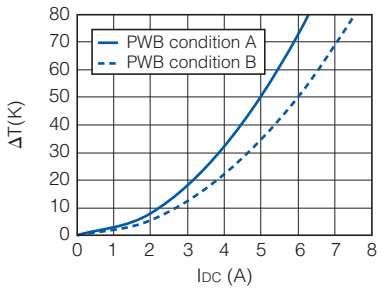
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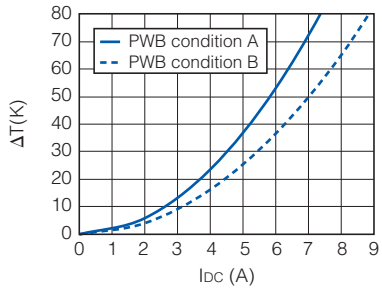
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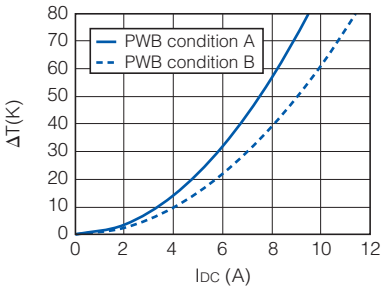
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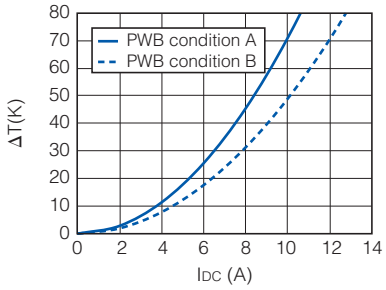
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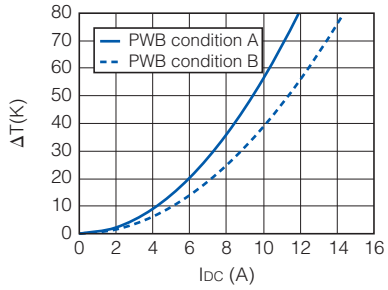
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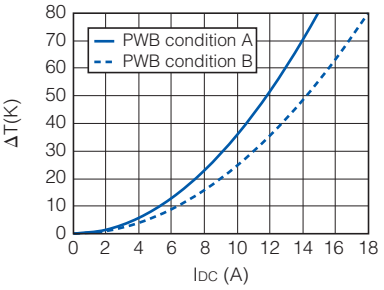
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ETQP3MR68KVP



ETQP3MR33KVP



2. Series PCC-M0630M-LP (ETQP3M□□□KVN)

Standard Parts

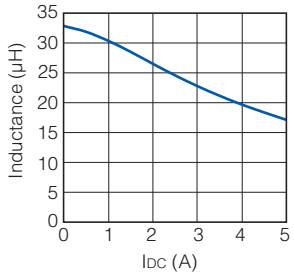
Part No.	Inductance *1		DCR (at 20 °C) (mΩ)		Rated Current (Typ. : A)			Series
	L0 (μH)	Tolerance (%)	Typ. (max.)	Tolerance (%)	ΔT=40K (*2)	ΔT=40K (*3)	ΔL=–30% (*4)	
ETQP3M330KVN	33.00	±20	206.00 (226.60)	±10	1.7	2.1	3.0	PCC-M0630M-LP [6.4×6.0×3.0(mm)]
ETQP3M220KVN	22.00		128.00 (140.80)		2.2	2.7	4.3	
ETQP3M150KVN	15.00		99.20 (109.12)		2.5	3.0	5.1	
ETQP3M100KVN	10.00		71.00 (78.10)		2.9	3.6	5.8	
ETQP3M6R8KVN	6.80		45.60 (50.16)		3.6	4.5	8.1	
ETQP3M4R7KVN	4.70		29.00 (31.90)		4.6	5.6	9.8	
ETQP3M3R3KVN	3.30		24.10 (26.51)		5.0	6.1	11.5	
ETQP3M2R2KVN	2.20		14.50 (15.95)		6.5	7.9	12.8	
ETQP3M1R5KVN	1.50		11.00 (12.10)		7.4	9.1	14.2	
ETQP3M1R0KVN	1.00		6.20 (6.82)		9.9	12.1	16.0	
ETQP3MR68KVN	0.68		5.20 (5.72)		10.8	13.2	20.2	

(*1) Measured at 100k Hz.
(*2) DC current which causes temperature rise of 40K. Parts are soldered by reflow on four-layer PWB (1.6 mm FR4) and measured at room temperature. See also (*5)
(*3) DC current which causes temperature rise of 40K. Parts are soldered by reflow on multilayer PWB with high heat dissipation performance. Note: Heat radiation constant are approx. 44 K/W measured on 6.5×6.0×3.0 mm case size. See also (*5)
(*4) Saturation rated current : DC current which causes L(0) drop –30 %.
(*5) Within a suitable application, the part's temperature depends on circuit design and certain heat dissipation conditions. This should be double checked in a worst case operation mode.
In normal case, the max.standard operating temperature of +155 °C should not be exceeded.
For higher operating temperature conditions, please contact Panasonic representative in your area.

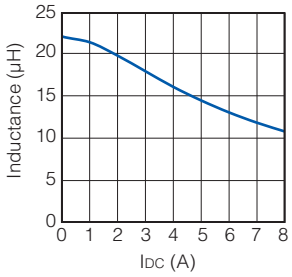
Performance Characteristics (Reference)

● Inductance vs DC Current

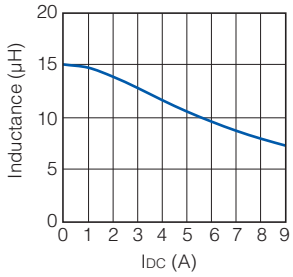
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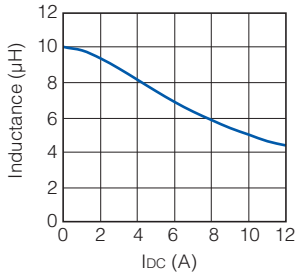
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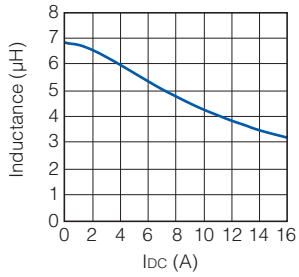
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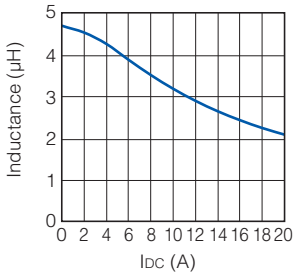
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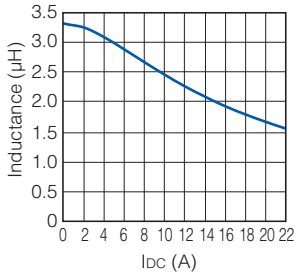
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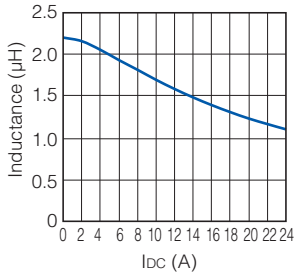
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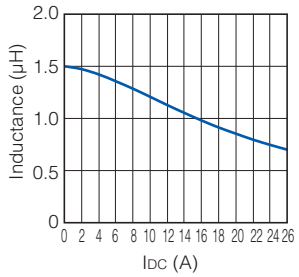
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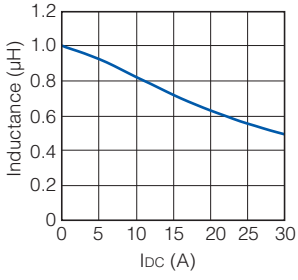
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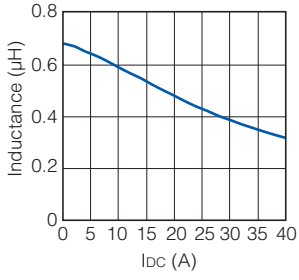
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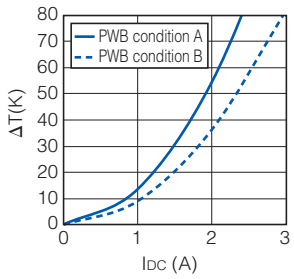


Performance Characteristics (Reference)

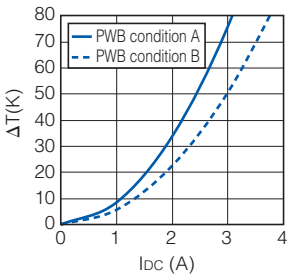
● Case Temperature vs DC Current

PWB condition A : Four-layer PWB (1.6 mm FR4), See also (*2)
PWB condition B : Multilayer PWB with high heat dissipation performance. See also (*3)

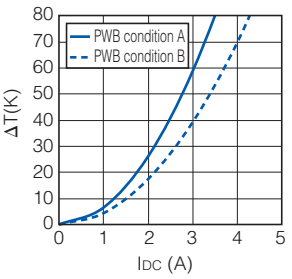
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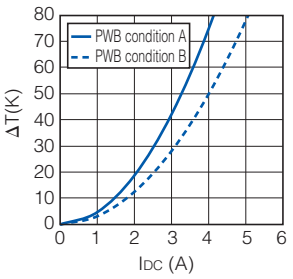
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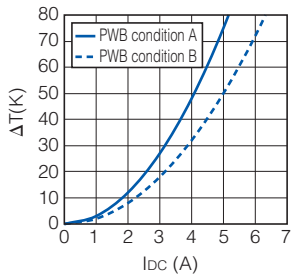
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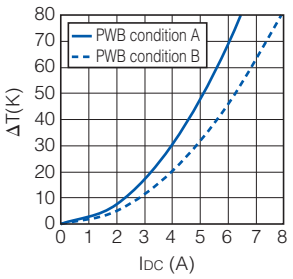
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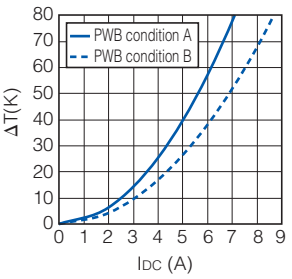
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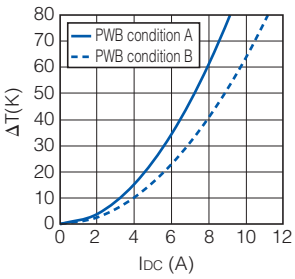
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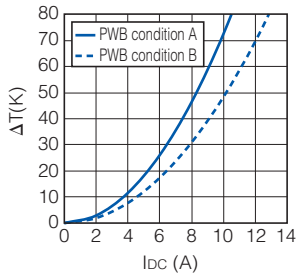
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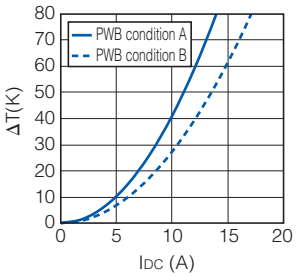
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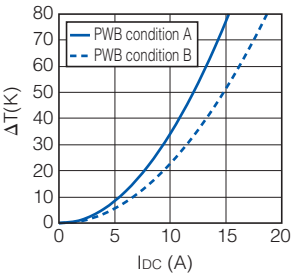
ETQP3M1R5KVN



ETQP3M1R0KVN



ETQP3MR68KVN



3. Series PCC-M0840M-LP (ETQP4M□□□KVK)

Standard Parts

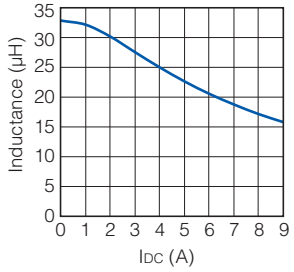
Part No.	Inductance *1		DCR (at 20 °C) (mΩ)		Rated Current (Typ. : A)			Series
	L0 (μH)	Tolerance (%)	Typ. (max.)	Tolerance (%)	ΔT=40K (*2)	ΔT=40K (*3)	ΔL=–30% (*4)	
ETQP4M330KVK	33.00	±20	118.00 (129.80)	±10	2.6	3.1	4.7	PCC-M0840M-LP [8.5×8.0×4.0(mm)]
ETQP4M220KVK	22.00		78.40 (86.24)		3.2	3.8	6.0	
ETQP4M150KVK	15.00		55.00 (60.50)		3.8	4.5	7.6	
ETQP4M100KVK	10.00		41.60 (45.76)		4.4	5.2	9.1	
ETQP4M6R8KVK	6.80		23.50 (25.85)		5.9	6.9	11.0	
ETQP4M4R7KVK	4.70		16.10 (17.71)		7.1	8.3	15.1	
ETQP4M3R3KVK	3.30		14.10 (15.51)		7.6	8.9	17.4	
ETQP4M2R2KVK	2.20		8.50 (9.35)		9.8	11.4	20.4	
ETQP4M1R5KVK	1.50		4.90 (5.39)		12.8	15.1	22.5	
ETQP4M1R0KVK	1.00		3.70 (4.07)		14.8	17.3	24.4	
ETQP4MR68KVK	0.68		2.92 (3.21)		16.6	19.5	29.0	

(*1) Measured at 100k Hz.
(*2) DC current which causes temperature rise of 40K. Parts are soldered by reflow on four-layer PWB (1.6 mm FR4) and measured at room temperature. See also (*5)
(*3) DC current which causes temperature rise of 40K. Parts are soldered by reflow on multilayer PWB with high heat dissipation performance. Note: Heat radiation constant are approx. 36 K/W measured on 8.5×8.0×4.0 mm case size. See also (*5)
(*4) Saturation rated current : DC current which causes L(0) drop –30 %.
(*5) Within a suitable application, the part's temperature depends on circuit design and certain heat dissipation conditions. This should be double checked in a worst case operation mode.
In normal case, the max.standard operating temperature of +155 °C should not be exceeded.
For higher operating temperature conditions, please contact Panasonic representative in your area.

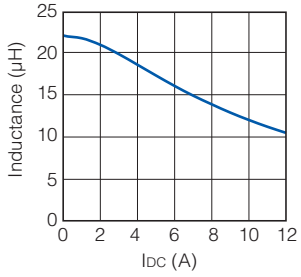
Performance Characteristics (Reference)

● Inductance vs DC Current

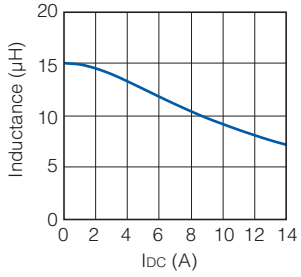
ETQP4M330KVK



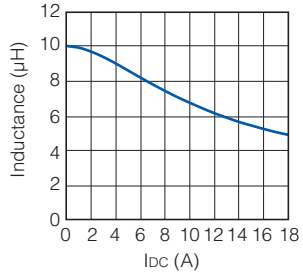
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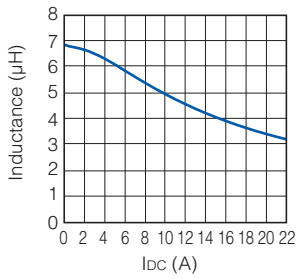
ETQP4M150KVK



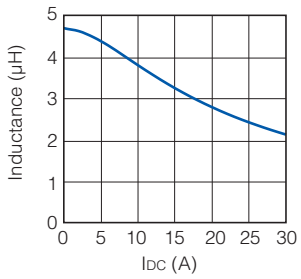
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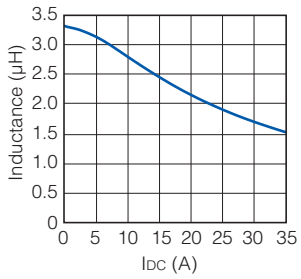
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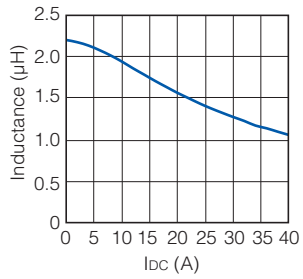
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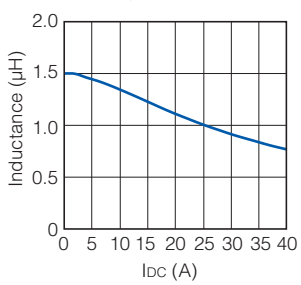
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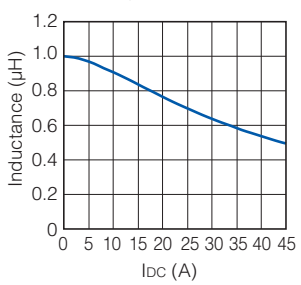
ETQP4M2R2KVK



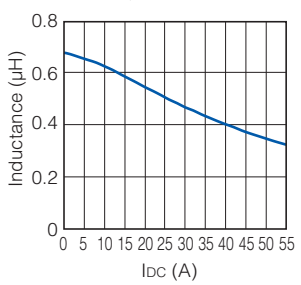
ETQP4M1R5KVK



ETQP4M1R0KVK



ETQP4MR68KVK

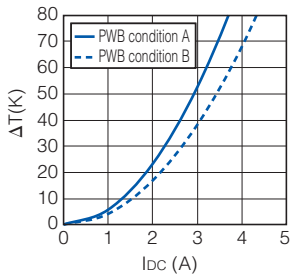


Performance Characteristics (Reference)

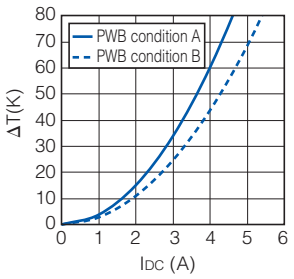
● Case Temperature vs DC Current

PWB condition A : Four-layer PWB (1.6 mm FR4), See also (*2)
PWB condition B : Multilayer PWB with high heat dissipation performance. See also (*3)

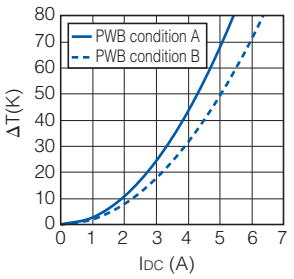
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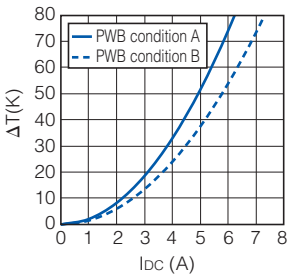
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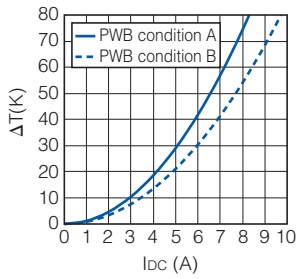
ETQP4M150KVK



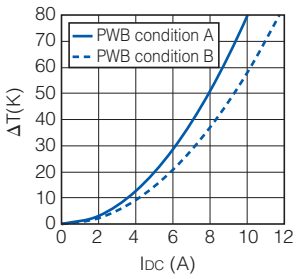
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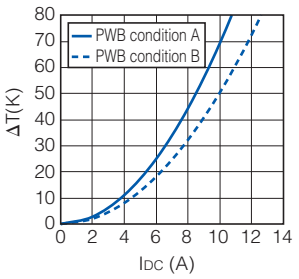
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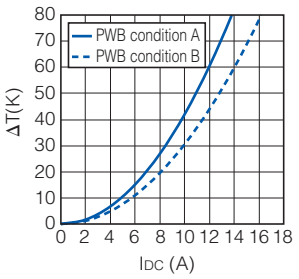
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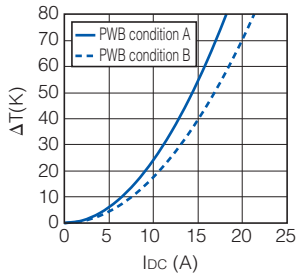
ETQP4M3R3KVK



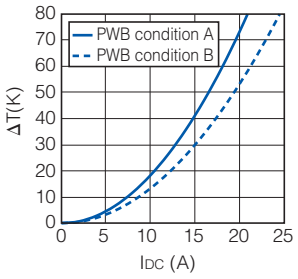
ETQP4M2R2KVK



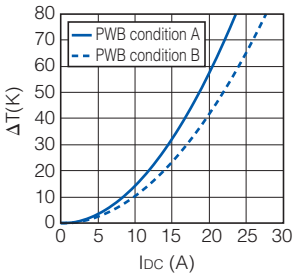
ETQP4M1R5KVK



ETQP4M1R0KVK



ETQP4MR68KVK



4. Series PCC-M1040M-LP (ETQP4M□□□KVC)

Standard Parts

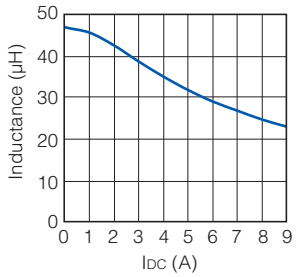
Part No.	Inductance *1		DCR (at 20 °C) (mΩ)		Rated Current (Typ. : A)			Series
	L0 (μH)	Tolerance (%)	Typ. (max.)	Tolerance (%)	△T=40K (*2)	△T=40K (*3)	△L=–30% (*4)	
ETQP4M470KVC	47.00	±20	132.00 (145.20)	±10	2.8	3.4	4.7	PCC-M1040M-LP [10.7×10.0×4.0(mm)]
ETQP4M330KVC	33.00		84.60 (93.06)		3.4	4.2	5.6	
ETQP4M220KVC	22.00		60.00 (66.00)		4.1	5.0	7.4	
ETQP4M150KVC	15.00		37.00 (40.70)		5.2	6.3	9.2	
ETQP4M100KVC	10.00		25.40 (27.94)		6.3	7.6	10.8	
ETQP4M6R8KVC	6.80		18.50 (20.35)		7.4	8.9	12.1	
▲ETQP4M4R7KVC	4.70		11.80 (12.98)		9.2	11.2	13.9	
ETQP4M3R3KVC	3.30		9.40 (10.34)		10.3	12.6	17.1	
ETQP4M2R2KVC	2.20		6.80 (7.48)		12.1	14.8	21.0	
ETQP4M1R5KVC	1.50		4.90 (5.39)		14.3	17.4	25.0	
ETQP4M1R0KVC	1.00		2.60 (2.86)		19.6	23.9	34.6	

(*1) Measured at 100k Hz.
(*2) DC current which causes temperature rise of 40K. Parts are soldered by reflow on four-layer PWB (1.6 mm FR4) and measured at room temperature. See also (*5)
(*3) DC current which causes temperature rise of 40K. Parts are soldered by reflow on multilayer PWB with high heat dissipation performance. Note: Heat radiation constant are approx. 27 K/W measured on 10.7×10.0×4.0 mm case size. See also (*5)
(*4) Saturation rated current : DC current which causes L(0) drop –30 %.
(*5) Within a suitable application, the part's temperature depends on circuit design and certain heat dissipation conditions. This should be double checked in a worst case operation mode.
In normal case, the max.standard operating temperature of +155 °C should not be exceeded.
For higher operating temperature conditions, please contact Panasonic representative in your area.
▲ Under development (Start of mass production: the 2nd half of 2019) Please contact us for customized part no.

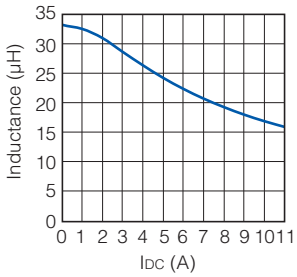
Performance Characteristics (Reference)

● Inductance vs DC Current

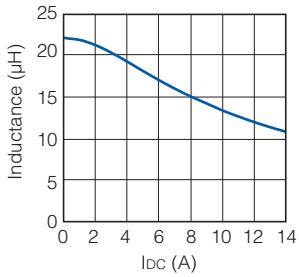
ETQP4M470KVC



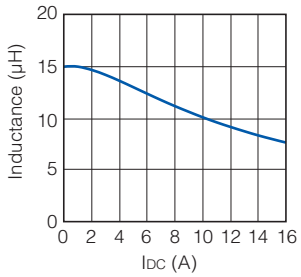
ETQP4M330KVC



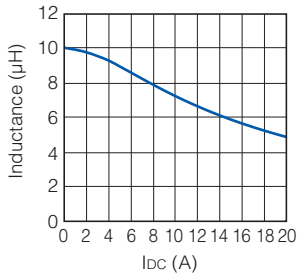
ETQP4M220KVC



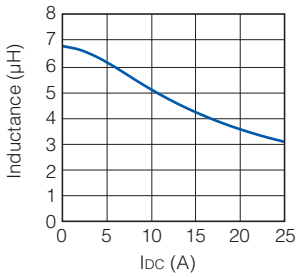
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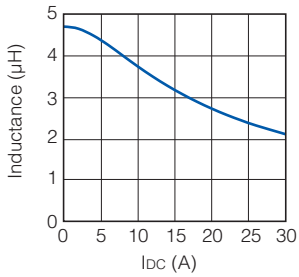
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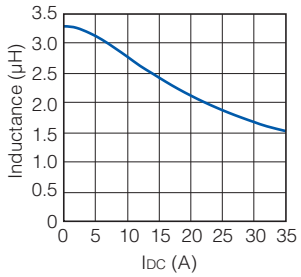
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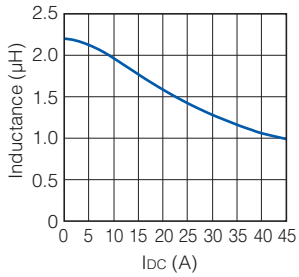
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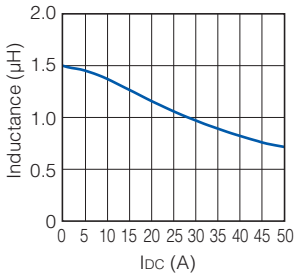
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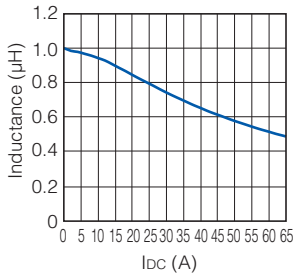
ETQP4M2R2KVC



ETQP4M1R5KVC



ETQP4M1R0KVC



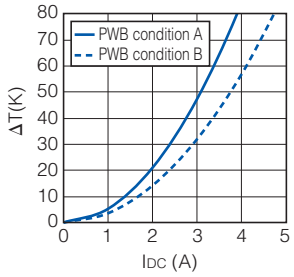
▲ Under development

Performance Characteristics (Reference)

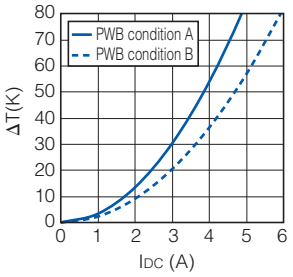
● Case Temperature vs DC Current

PWB condition A : Four-layer PWB (1.6 mm FR4), See also (*2)
PWB condition B : Multilayer PWB with high heat dissipation performance. See also (*3)

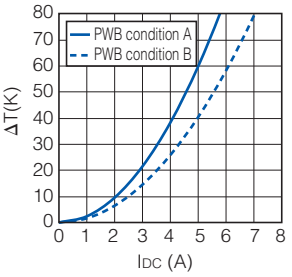
ETQP4M470KVC



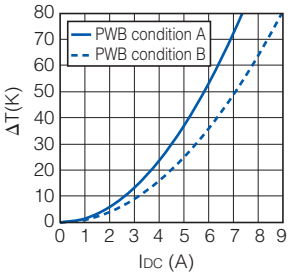
ETQP4M330KVC



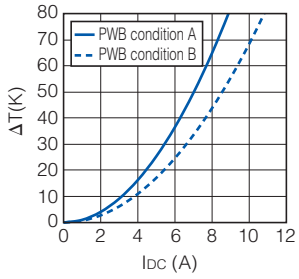
ETQP4M220KVC



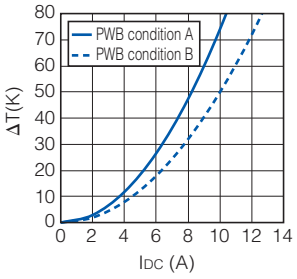
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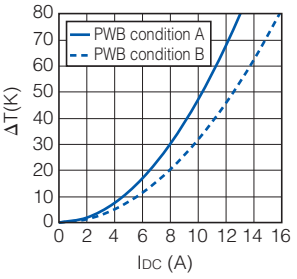
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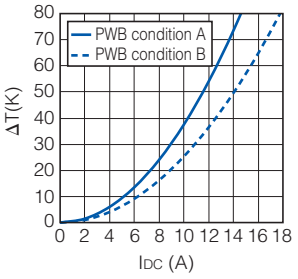
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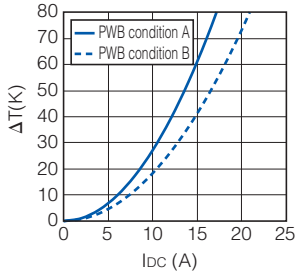
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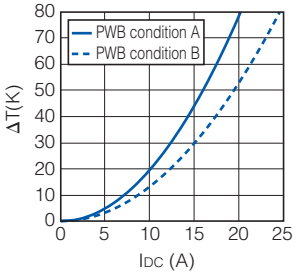
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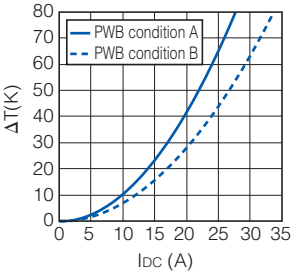
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ETQP4M1R5KVC



ETQP4M1R0KVC

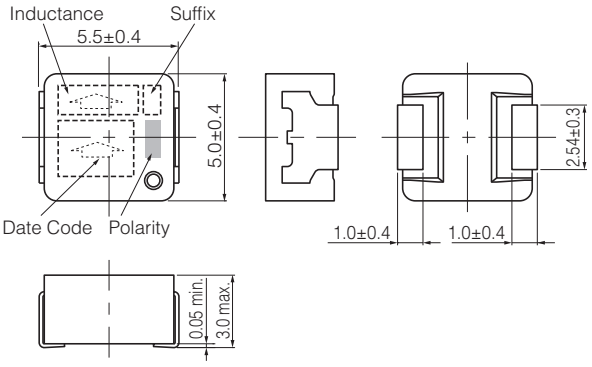


▲ Under development

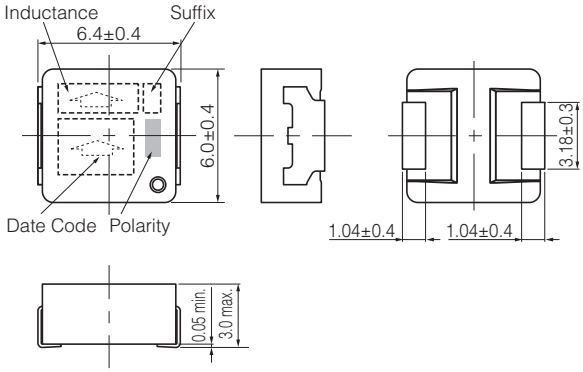
Dimensions in mm (not to scale)

Dimensional tolerance unless noted : ±0.5

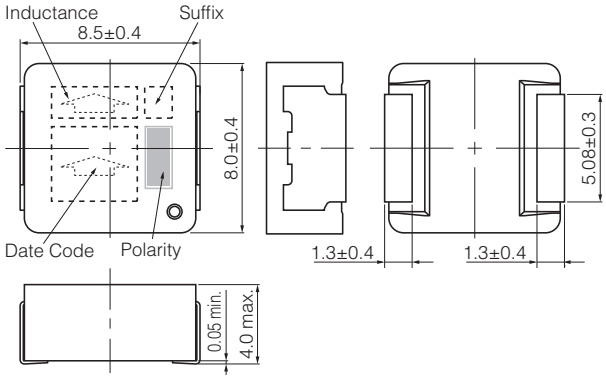
Series PCC-M0530M-LP
(ETQP3M□□□KVP)



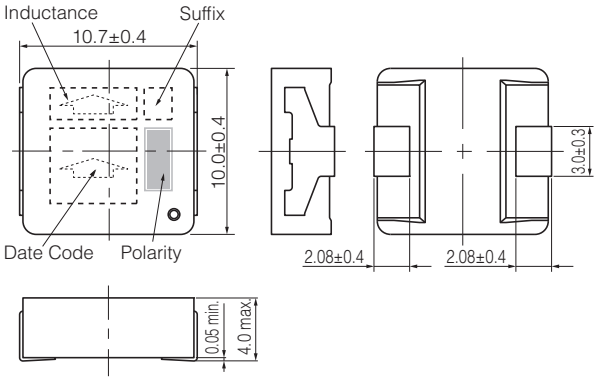
Series PCC-M0630M-LP
(ETQP3M□□□KVN)



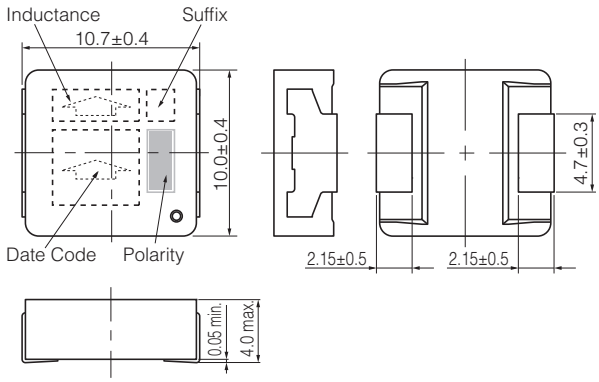
Series PCC-M0840M-LP
(ETQP4M□□□KVK)



Series PCC-M1040M-LP
(ETQP4M□□□*KVC)
* Exemption "1R0"



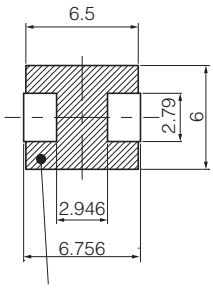
Series PCC-M1040M-LP
(ETQP4M1R0KVC)



Recommended Land Pattern in mm (not to scale)

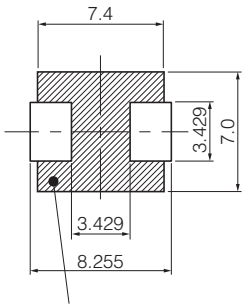
Dimensional tolerance unless noted : ±0.5

Series PCC-M0530M-LP
(ETQP3M□□□KVP)



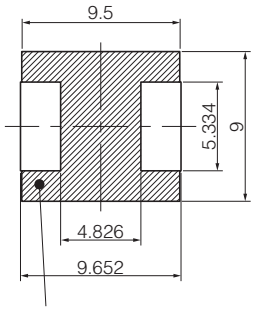
Don't wire on the pattern
on shaded portion the PWB.

Series PCC-M0630M-LP
(ETQP3M□□□KVN)



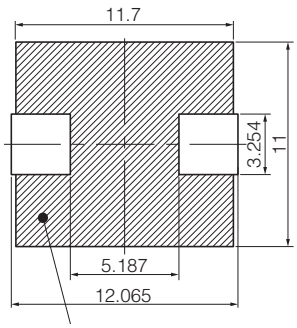
The same as the left.

Series PCC-M0840M-LP
(ETQP4M□□□KVK)



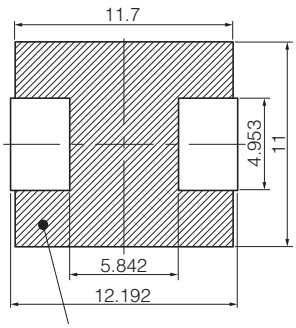
The same as the left.

Series PCC-M1040M-LP
(ETQP4M□□□*KVC)
✻ Exemption "1R0"



Don't wire on the pattern
on shaded portion the PWB.

Series PCC-M1040M-LP
(ETQP4M1R0KVC)



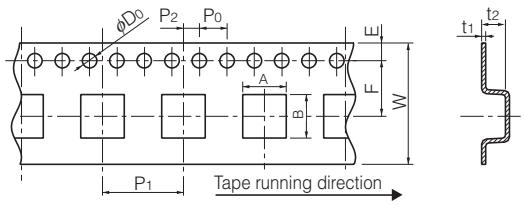
The same as the left.

■ As for Soldering Conditions and Safety Precautions (Power Choke Coils (Automotive Grade)),

Please see Data Files

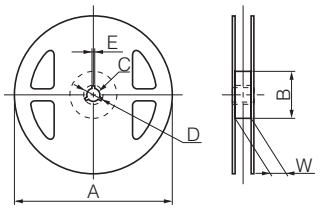
Packaging Methods (Taping)

● Embossed Carrier Tape Dimensions in mm (not to scale)



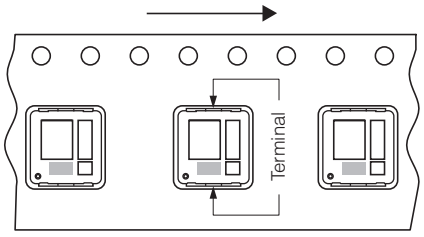
Series	A	B	W	E	F	P_1	P_2	P_0	ϕD_0	t_1	t_2
PCC-M0530M-LP	5.6	6.1	16	1.75	7.5	8	2	4	1.5	0.3	3.3
PCC-M0630M-LP	6.5	7.1	16	1.75	7.5	8	2	4	1.5	0.3	3.3
PCC-M0840M-LP	8.63	9.1	16	1.75	7.5	12	2	4	1.5	0.4	6.0
PCC-M1040M-LP	10.65	11.75	24	1.75	11.5	16	2	4	1.5	0.5	6.35

● Taping Reel Dimensions in mm (not to scale)



Series	A	B	C	D	E	W
PCC-M0530M-LP PCC-M0630M-LP PCC-M0840M-LP	330	(100)	13	21	2	17.5
PCC-M1040M-LP						25.5

Component Placement (Taping)



Series M0530M-LP
M0630M-LP
M0840M-LP
M1040M-LP

Standard Packing Quantity/Reel

Series	Part No.	Minimum Quantity / Packing Unit	Quantity per reel
PCC-M0530M-LP	ETQP3M□□□KVP	4,000 pcs / box (2 reel)	2,000 pcs
PCC-M0630M-LP	ETQP3M□□□KVN	4,000 pcs / box (2 reel)	2,000 pcs
PCC-M0840M-LP	ETQP4M□□□KVK	1,000 pcs / box (2 reel)	500 pcs
PCC-M1040M-LP	ETQP4M□□□KVC	1,000 pcs / box (2 reel)	500 pcs

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Panasonic

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