

## Power Choke Coil (Automotive Grade)

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



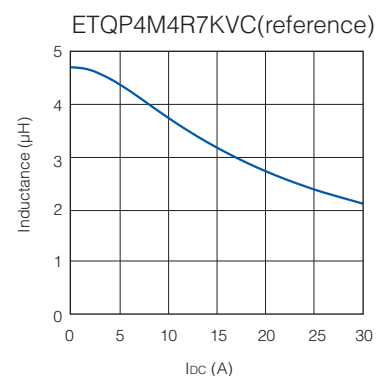
High heat resistance and high reliability  
 Using metal composite core (MC)

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



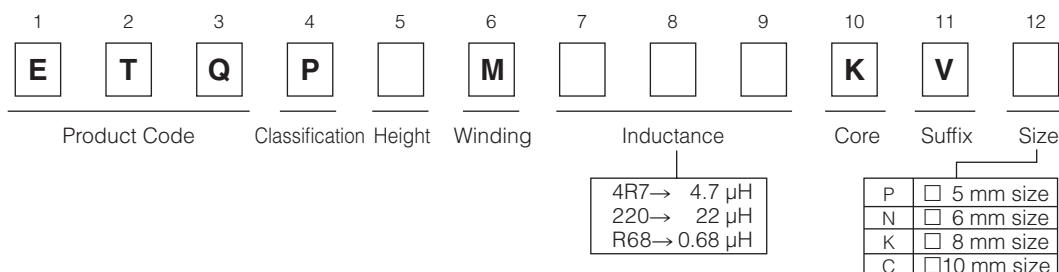
### Recommended Applications

- 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



### 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		ΔL=-30%	
					(*2)	(*3)	(*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	
ETQP3MR33KVP	0.33		4.85 ( 5.34)		10.6	12.7	21.8	

**NEW**

(\*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 %.

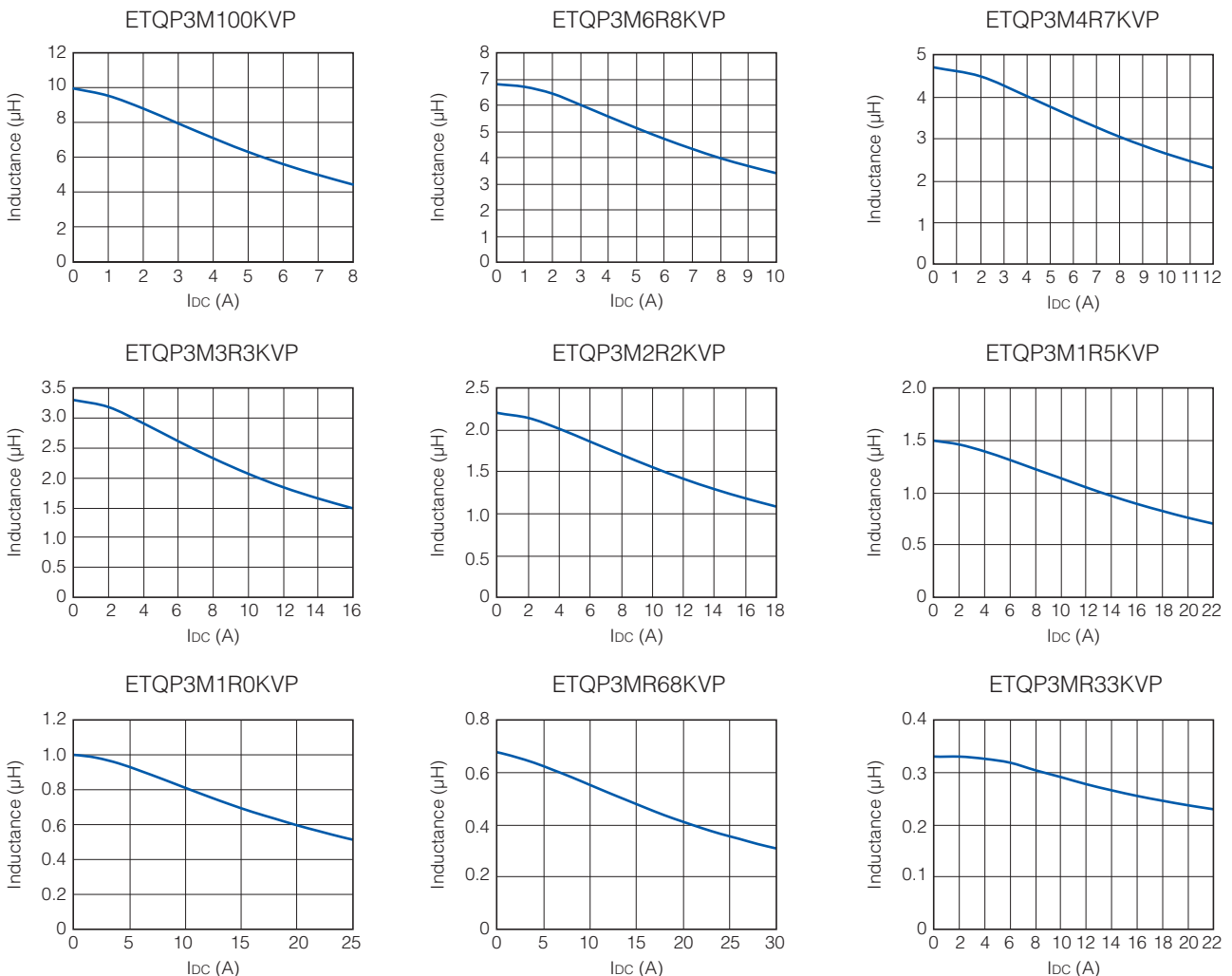
(\*5) Within a suitable application, the part's temperature depends on circuit design and certain heat dissipation conditions. This should be double checked in a worst case operation mode.

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

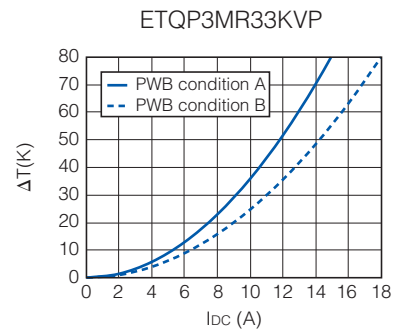
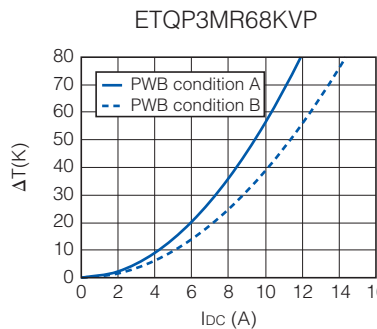
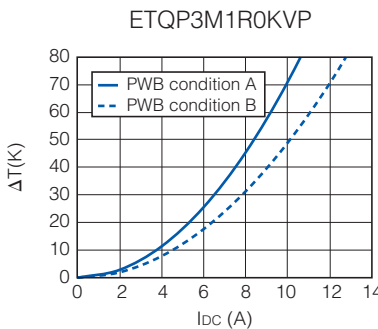
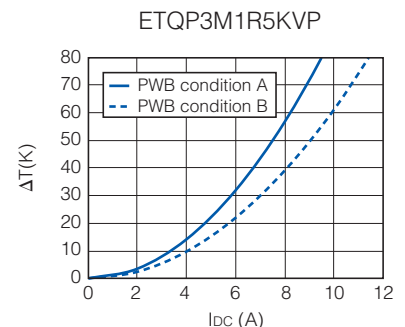
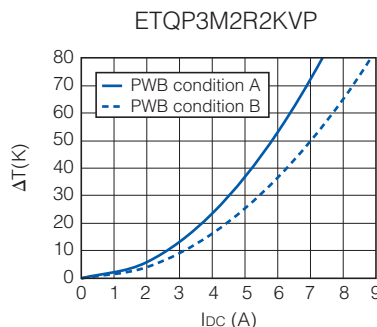
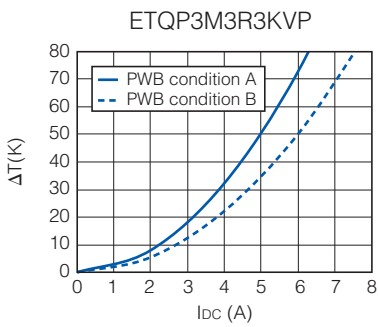
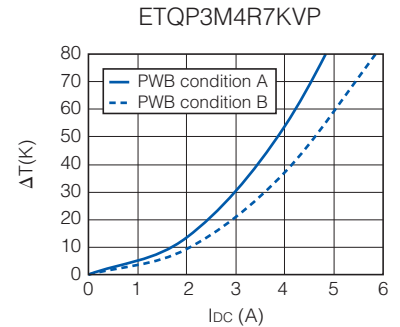
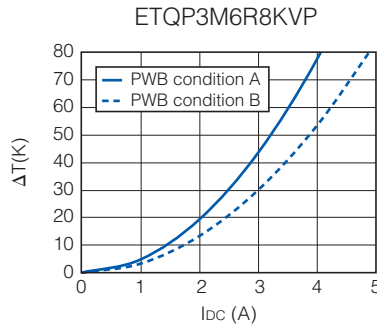
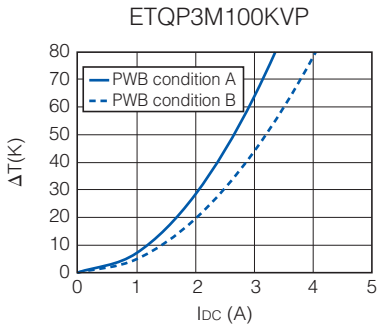


## Performance Characteristics (Reference)

### ● 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)



## 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		ΔL=-30%	
					(*2)	(*3)	(*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 %.

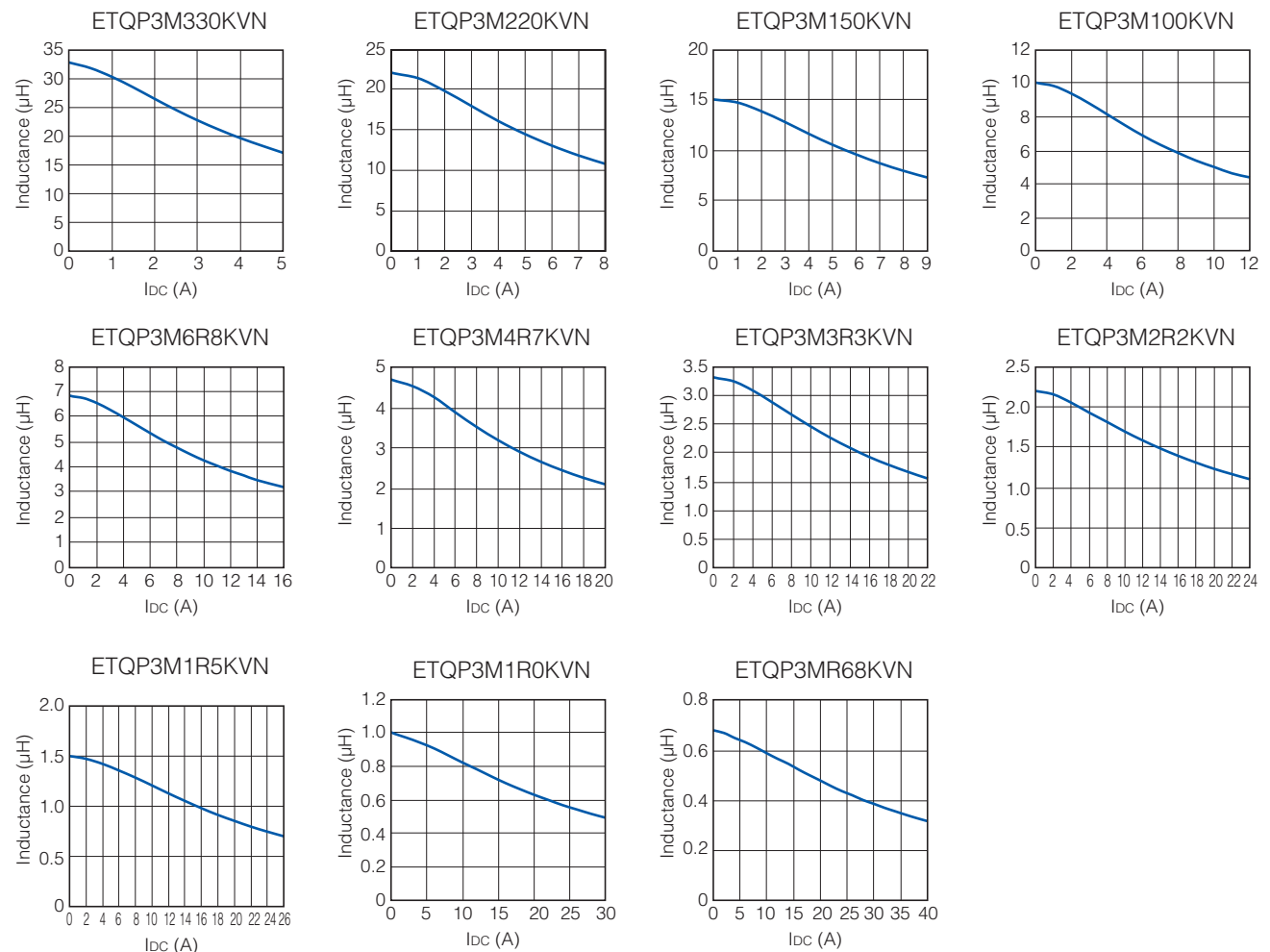
(\*5) Within a suitable application, the part's temperature depends on circuit design and certain heat dissipation conditions. This should be double checked in a worst case operation mode.

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

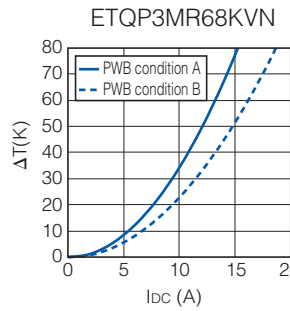
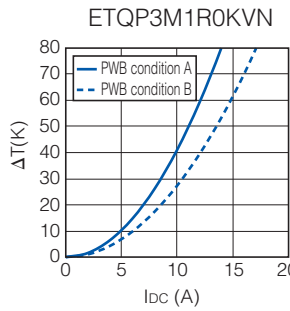
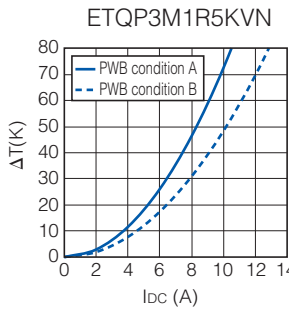
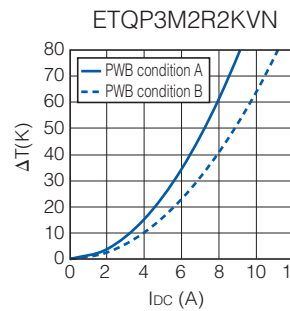
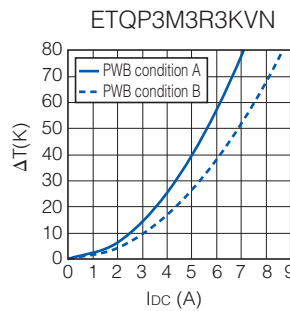
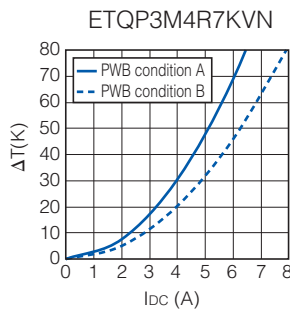
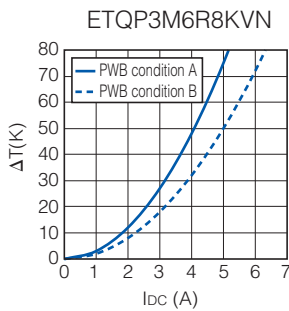
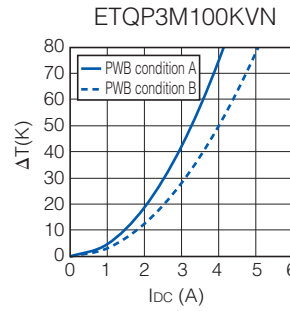
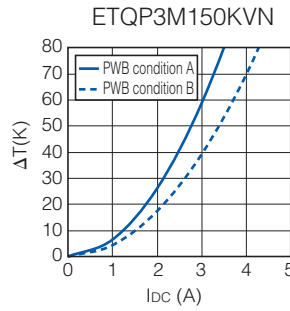
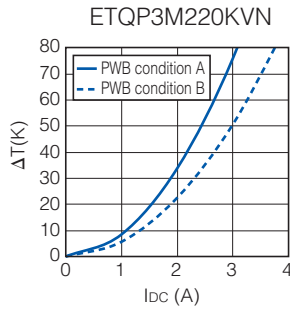
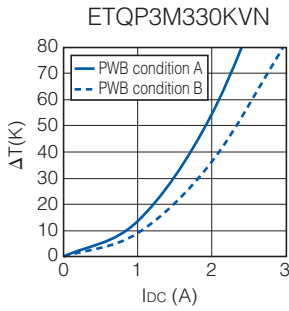


## Performance Characteristics (Reference)

### ● 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)



### 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		ΔL=-30%	
					(*2)	(*3)	(*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 %.

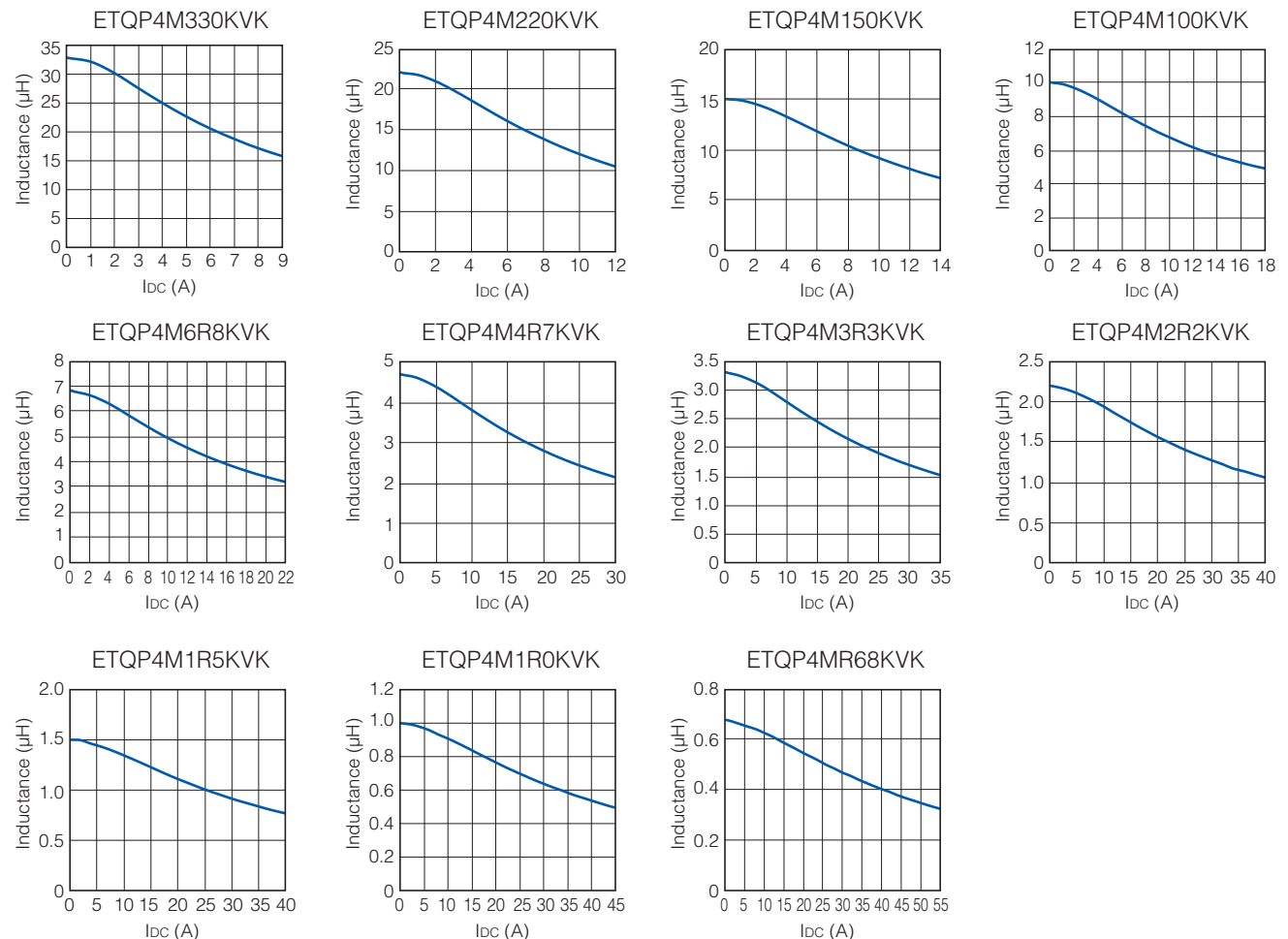
(\*5) Within a suitable application, the part's temperature depends on circuit design and certain heat dissipation conditions. This should be double checked in a worst case operation mode.

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

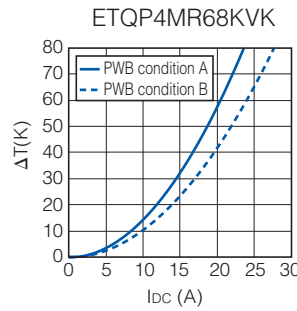
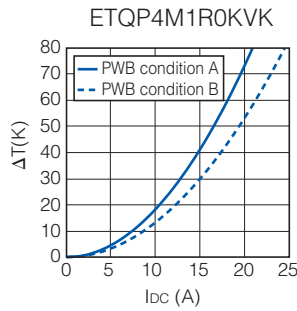
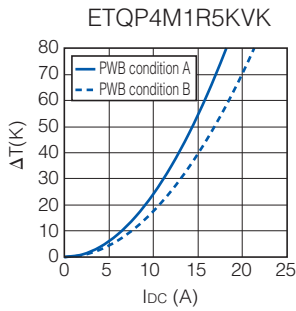
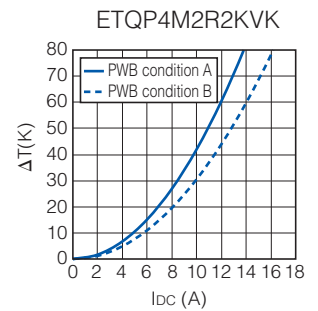
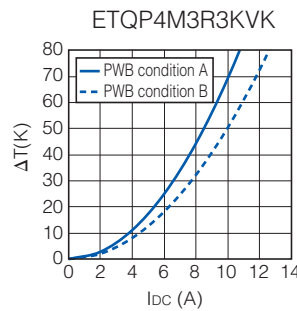
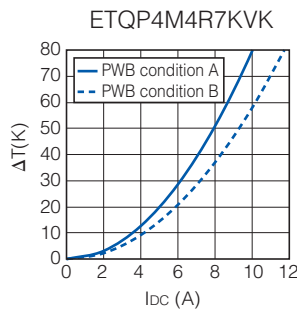
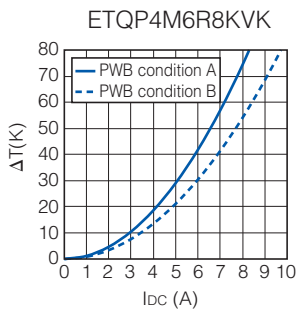
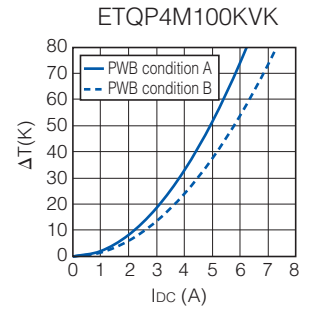
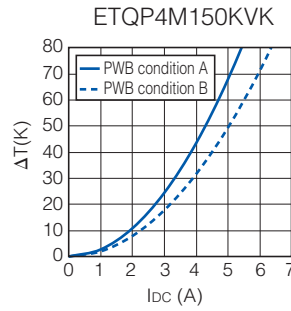
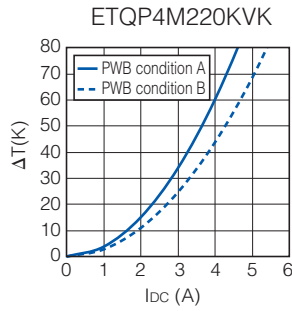
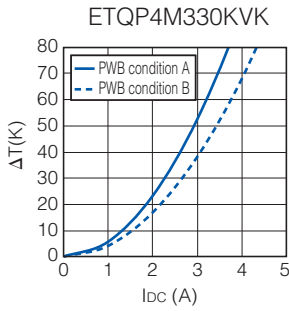


## Performance Characteristics (Reference)

### ● 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)



## 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 (%)	ΔT=40K		ΔL=-30%	
					(*2)	(*3)	(*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.

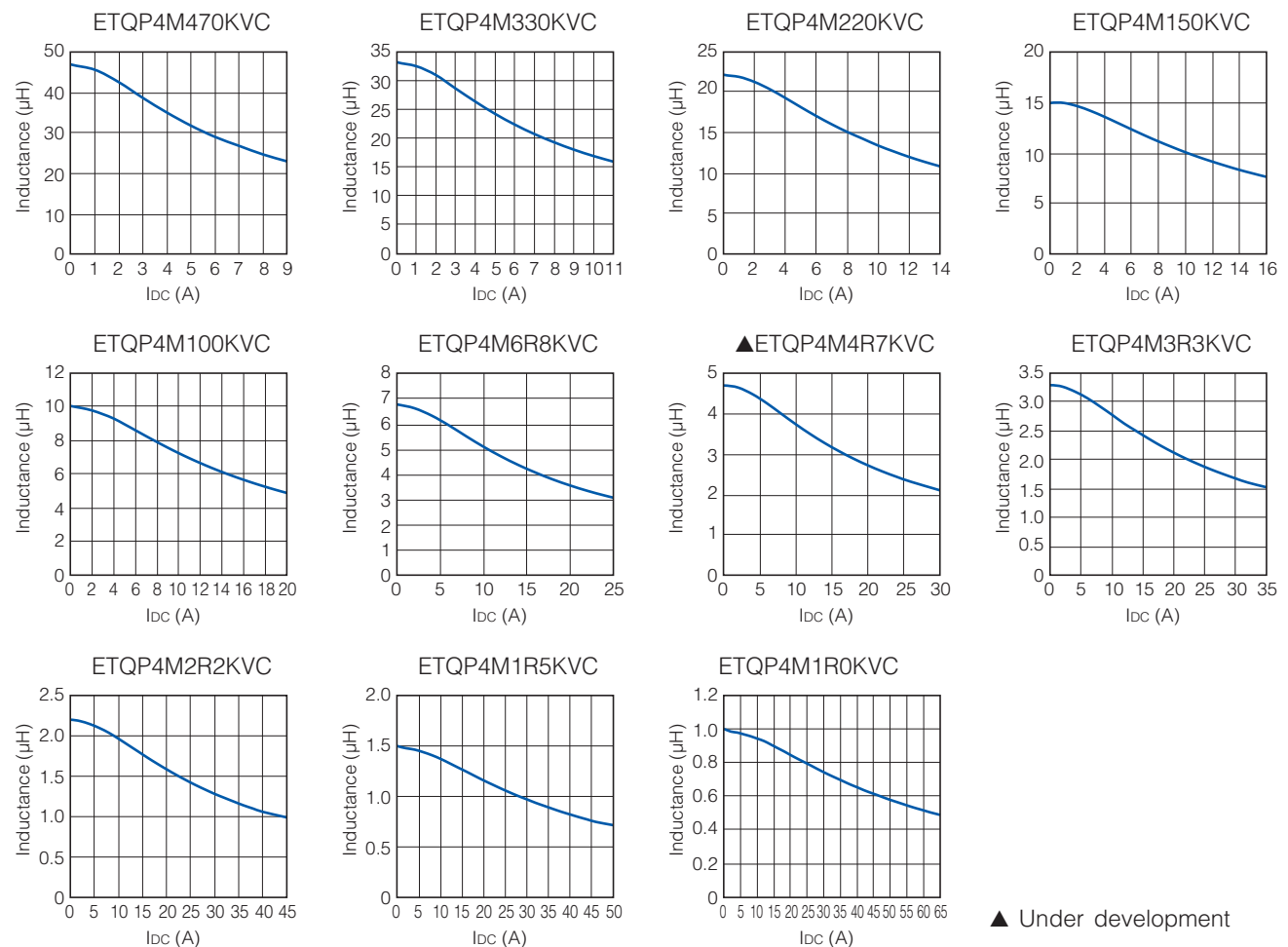
In normal case, the max.standard operating temperature of +155 °C should not be exceeded.

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



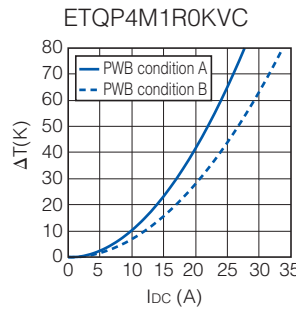
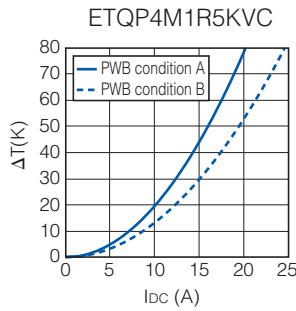
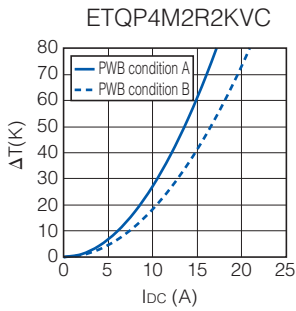
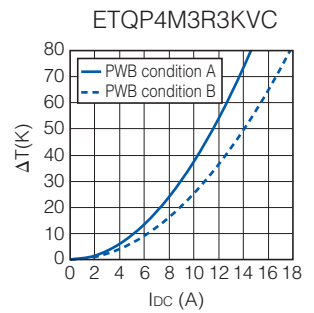
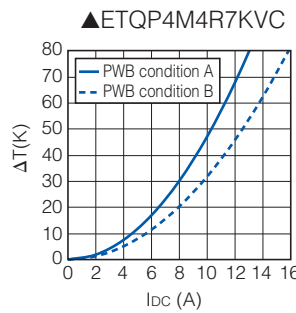
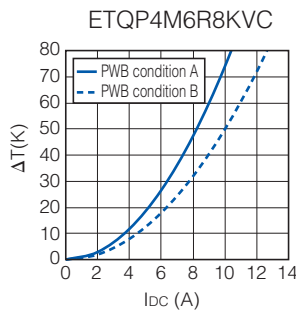
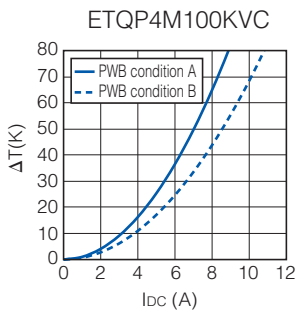
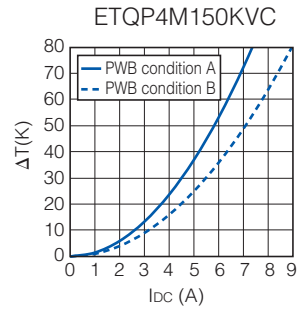
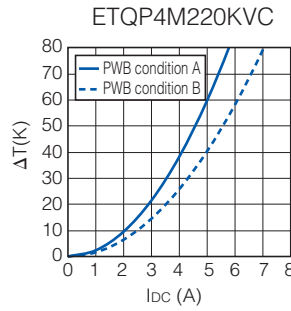
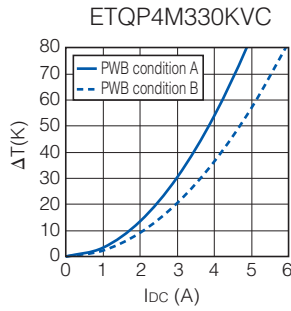
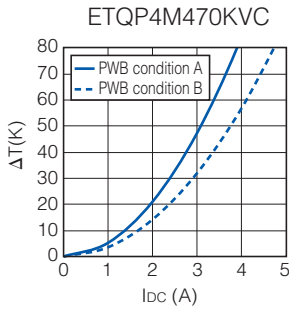


## Performance Characteristics (Reference)

### ● 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)

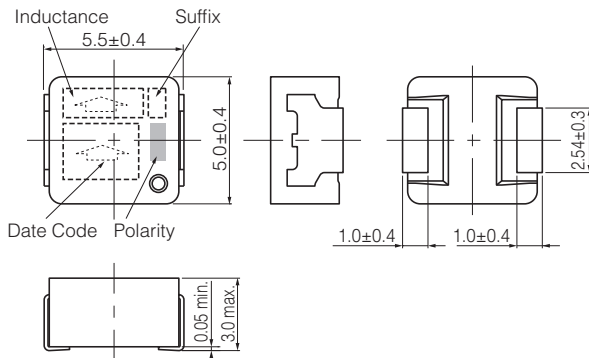


▲ Under development

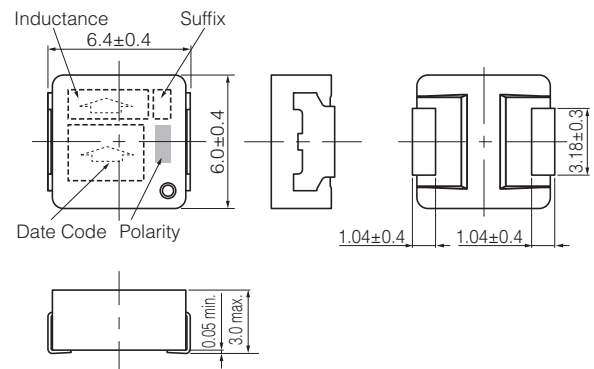
## Dimensions in mm (not to scale)

Dimensional tolerance unless noted :  $\pm 0.5$

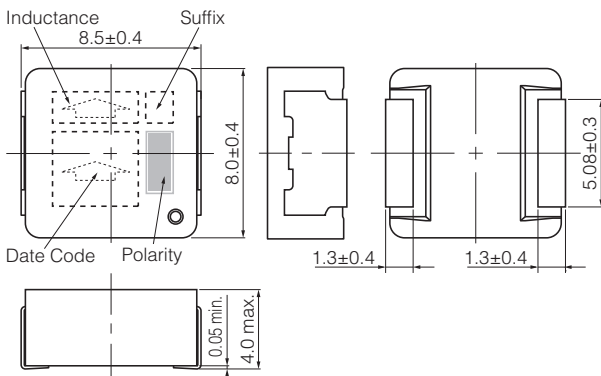
**Series PCC-M0530M-LP**  
(ETQP3M□□□KVP)



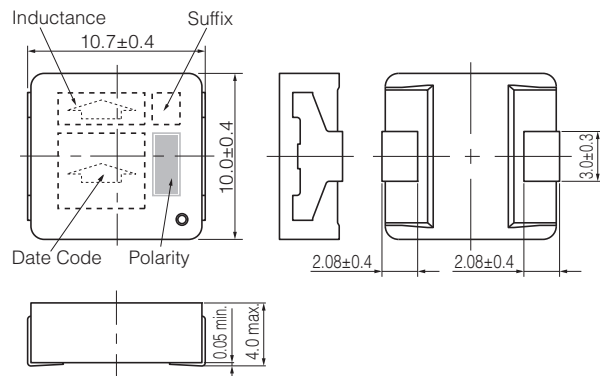
**Series PCC-M0630M-LP**  
(ETQP3M□□□KVN)



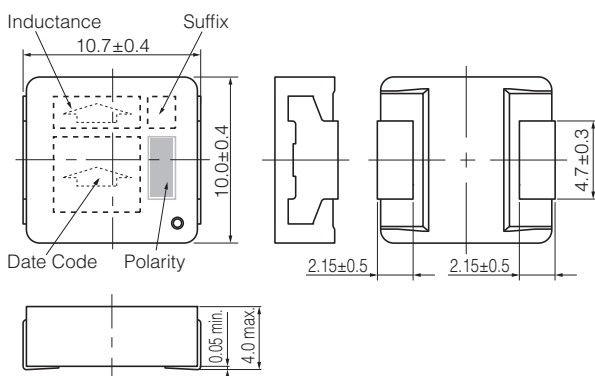
**Series PCC-M0840M-LP**  
(ETQP4M□□□KVK)



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



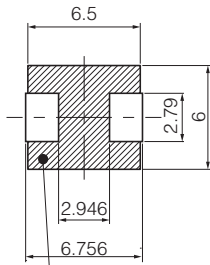
**Series PCC-M1040M-LP**  
(ETQP4M1R0KVC)



## Recommended Land Pattern in mm (not to scale)

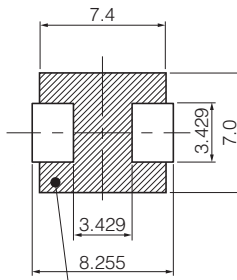
Dimensional tolerance unless noted :  $\pm 0.5$

Series PCC-M0530M-LP  
(ETQP3M□□□KVP)



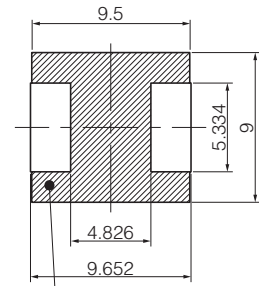
Don't wire on the pattern on shaded portion the PWB.

Series PCC-M0630M-LP  
(ETQP3M□□□KVN)



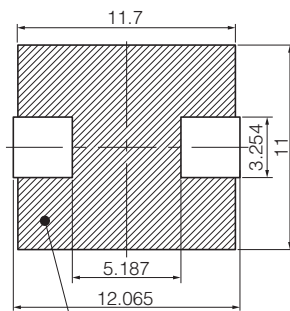
The same as the left.

Series PCC-M0840M-LP  
(ETQP4M□□□KVK)



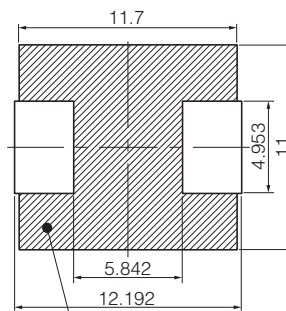
The same as the left.

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



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

Series PCC-M1040M-LP  
(ETQP4M1R0KVC)



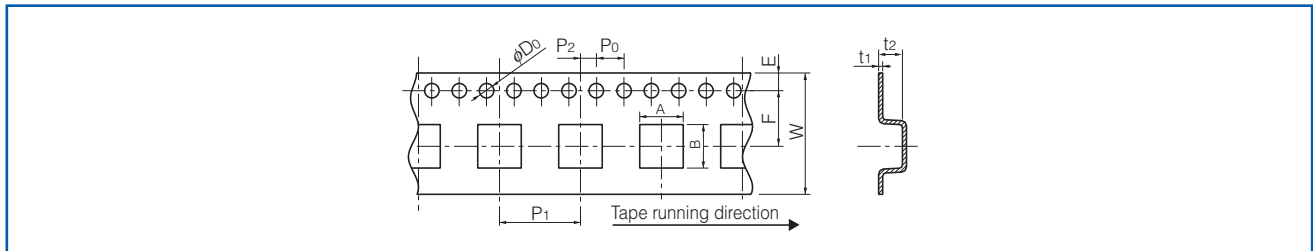
The same as the left.

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

Please see Data Files

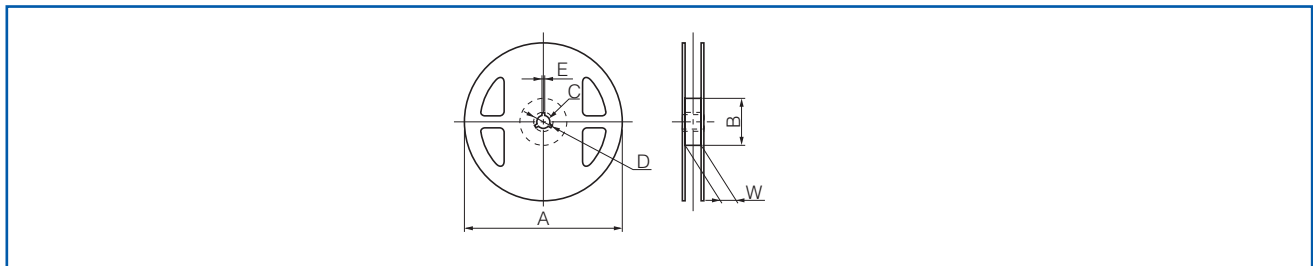
## Packaging Methods (Taping)

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



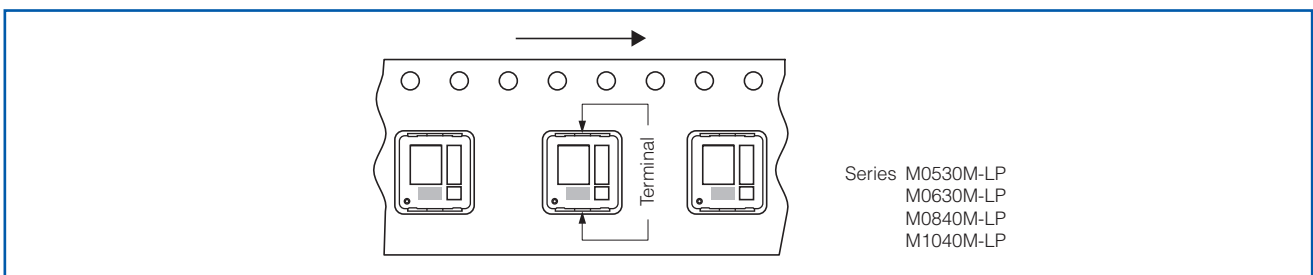
Series	A	B	W	E	F	P <sub>1</sub>	P <sub>2</sub>	P <sub>0</sub>	φD <sub>0</sub>	t <sub>1</sub>	t <sub>2</sub>
PCC-M0530M-LP	5.6	6.1	16	1.75	7.5	8	2	4	1.5	0.3	3.3
PCC-M0630M-LP	6.5	7.1	16	1.75	7.5	8	2	4	1.5	0.3	3.3
PCC-M0840M-LP	8.63	9.1	16	1.75	7.5	12	2	4	1.5	0.4	6.0
PCC-M1040M-LP	10.65	11.75	24	1.75	11.5	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)



## 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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- When you use the inventory of our products for which it is unclear whether those products are compliant with the RoHS Directive/REACH Regulation, please select "Sales Inquiry" in the website inquiry form and contact us.

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