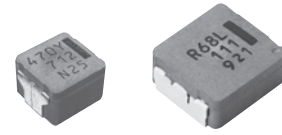


## Power Choke Coil (Automotive Grade)

Series: **PCC-M0530M (MC) PCC-M0540M (MC)**  
**PCC-M0630M (MC) PCC-M0645M (MC)**  
**PCC-M0754M (MC) PCC-M0750M (MC)**  
**PCC-M0854M (MC) PCC-M0850M (MC)**  
**PCC-M1054M (MC) PCC-M1050M (MC)**  
**PCC-M1050ML (MC) PCC-M1060ML (MC)**



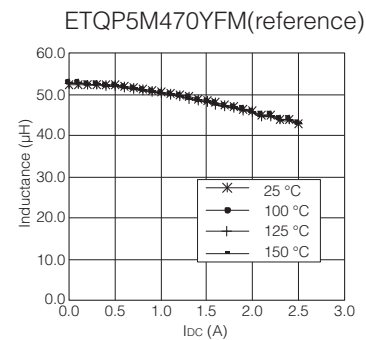
High heat resistance and high reliability  
 Using metal composite core (MC)

Industrial Property : patents 21 (Registered 2/Pending 19)

### Features

- High heat resistance : Operation up to 150 °C including self-heating
- 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 (Fig.1)
- Low audible (buzz) noise : New metal composite core technology
- High efficiency : Low R<sub>DC</sub> 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, Temp.



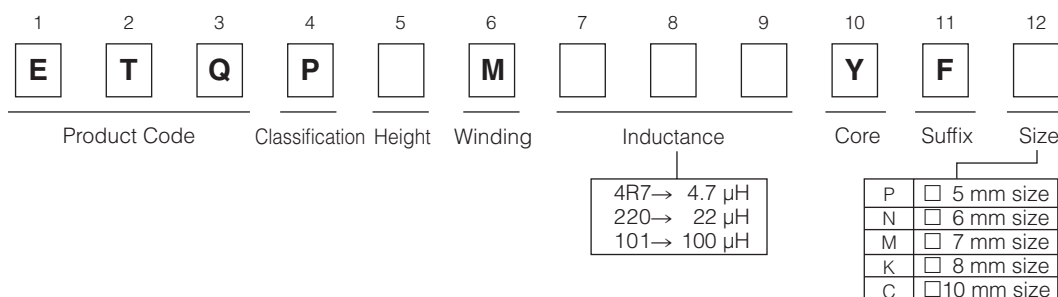
### Recommended Applications

- 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)

- 1,000 pcs./box (2 reel) : PCC-M0645M, M0754M, M0750M, M0854M, M0850M, M1054M, M1050M, M1050ML, M1060ML
- 2,000 pcs./box (2 reel) : PCC-M0530M, M0540M, M0630M

### Explanation of Part Numbers



### Temperature rating

Operating temperature range		T <sub>c</sub> : -40 °C to +150 °C (Including self-temperature rise)
Storage condition	After PWB mounting	
	Before PWB mounting	T <sub>a</sub> : -5 °C to +35 °C 85%RH max.

## 1. Series PCC-M0530M/PCC-M0540M (ETQP3M□□□YFP/ETQP4M□□□YFP)

### Standard Parts

Series	Part No.	Inductance *1		DCR (at 20 °C) (mΩ)		Rated Current (Typ. : A)		
		L0 (μH)	Tolerance (%)	Typ. (max.)	Tolerance (%)	ΔT=40K (*2)	ΔT=40K (*3)	ΔL=-30% (*4)
PCC-M0530M [5.5×5.0×3.0(mm)]	ETQP3M2R2YFP	2.2	±20	22.6 ( 24.8)	±10	4.8	5.8	10.9
	ETQP3M3R3YFP	3.3		31.3 ( 34.4)		4.1	5.0	8.6
PCC-M0540M [5.5×5.0×4.0(mm)]	ETQP4M4R7YFP	4.7		36.0 ( 39.6)		4.0	4.8	7.7
	ETQP4M220YFP	22		163.0 (179.0)		1.9	2.3	3.1

(\*1) Measured at 100 kHz.

(\*2) DC current which causes temperature rise of 40 K. 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 40 K. Parts are soldered by reflow on multilayer PWB with high heat dissipation performance. Note: Heat radiation constant are approx. 52 K/W measured on 5.5×5.0×3.0 mm case size and approx. 48 K/W measured on 5.5×5.0×4.0 mm case size. See also (\*5)

(\*4) Saturation rated current : DC current which causes L(0) drop -30 %.

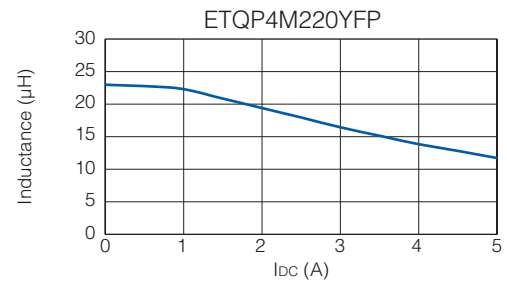
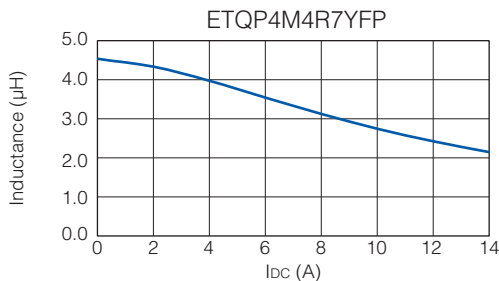
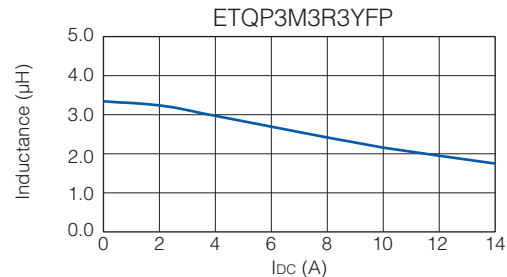
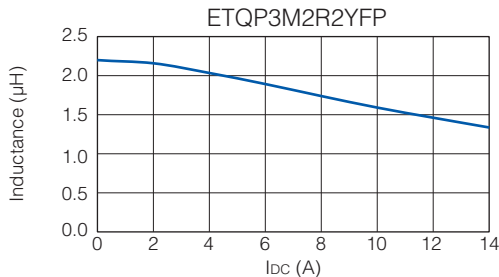
(\*5) Within a suitable application, the part's temperature depends on circuit design and certain heat dissipation conditions. This should be double checked in a worst case operation mode.

In normal case, the max.standard operating temperature of +150 °C should not be exceeded.

For higher operating temperature conditions, please contact Panasonic representative in your area.

### Performance Characteristics (Reference)

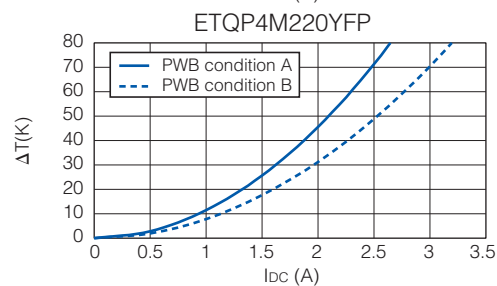
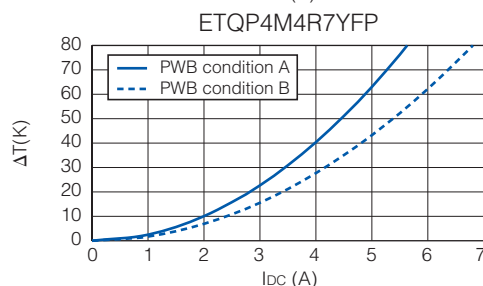
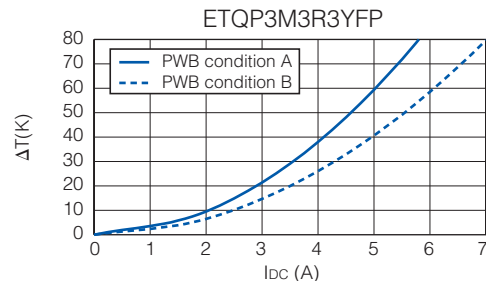
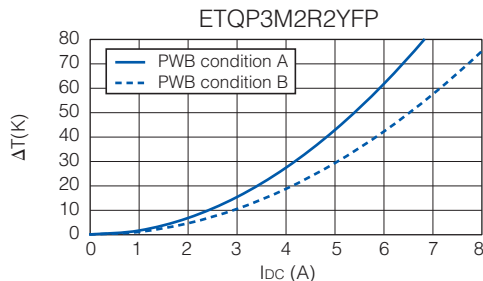
#### ● Inductance vs DC Current



#### ● 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/PCC-M0645M (ETQP3M□□□YFN/ETQP4M□□□YFN)

Standard Parts								
Series	Part No.	Inductance *1		DCR (at 20 °C) (mΩ)		Rated Current (Typ. : A)		
		L0 (μH)	Tolerance (%)	Typ. (max.)	Tolerance (%)	ΔT=40K		ΔL=-30%
						(*2)	(*3)	(*4)
PCC-M0630M [6.5×6.0×3.0(mm)]	ETQP3MR68YFN	0.68	±20	6.30 ( 6.90)	±10	9.8	12.0	24.0
	ETQP3M1R0YFN	1.0		7.90 ( 8.70)		8.8	10.7	20.0
<b>NEW</b> PCC-M0645M [6.5×6.0×4.5(mm)]	ETQP4M3R3YFN	3.3		16.10 ( 17.71)		6.4	8.2	13.3
	ETQP4M6R8YFN	6.8		39.30 ( 43.20)		4.1	5.2	10.0
	ETQP4M100YFN	10		54.20 ( 59.60)		3.3	4.5	8.3
	ETQP4M220YFN	22		126.00 (138.60)		2.3	2.9	6.0
	ETQP4M330YFN	33		172.00 (189.20)		2.0	2.5	4.1
ETQP4M470YFN	47	210.00 (231.00)		1.8		2.2	3.8	

(\*1) Measured at 100 kHz.

(\*2) DC current which causes temperature rise of 40 K. 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 40 K. 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 and approx. 37 K/W measured on 6.5×6.0×4.5 mm case size. See also (\*5)

(\*4) Saturation rated current : DC current which causes L(0) drop -30 %.

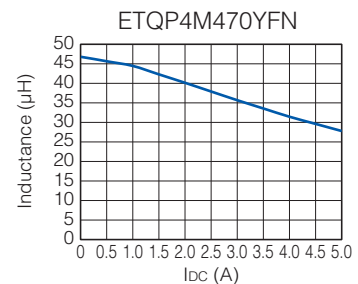
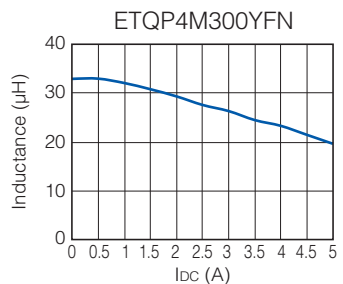
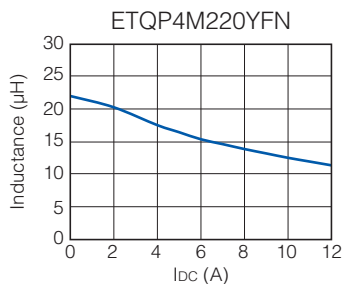
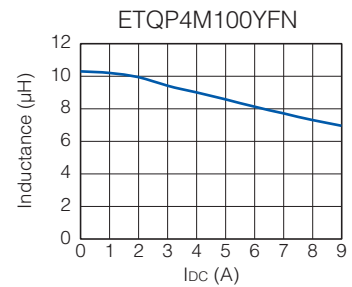
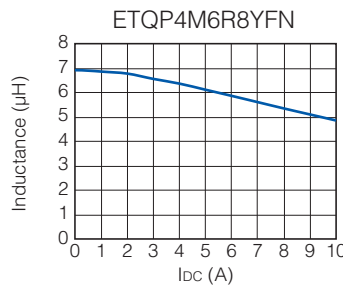
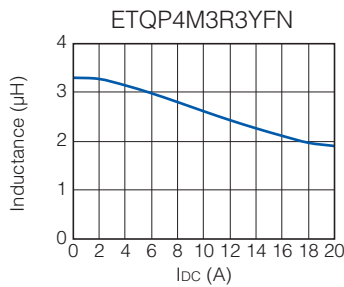
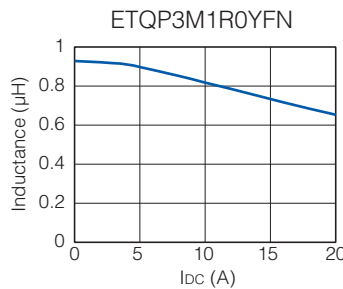
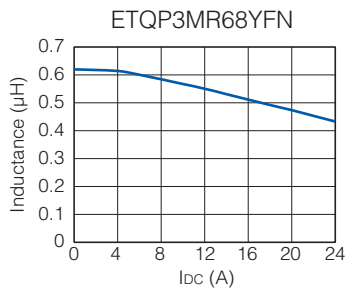
(\*5) Within a suitable application, the part's temperature depends on circuit design and certain heat dissipation conditions. This should be double checked in a worst case operation mode.

In normal case, the max. standard operating temperature of +150 °C should not be exceeded.

For higher operating temperature conditions, please contact Panasonic representative in your area.

## Performance Characteristics (Reference)

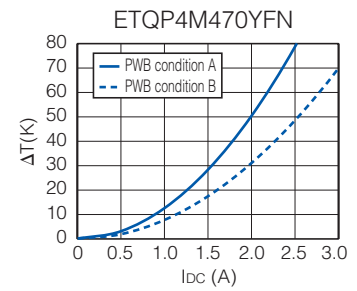
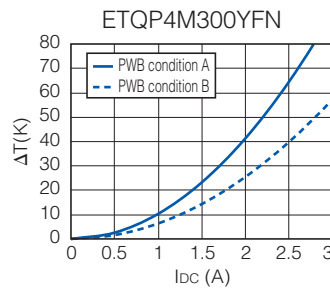
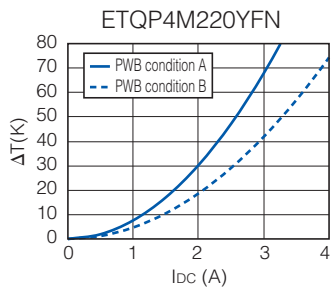
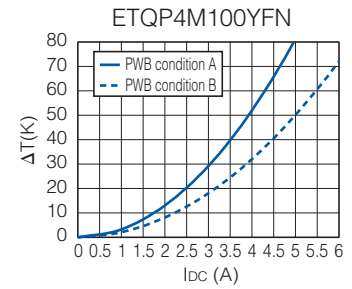
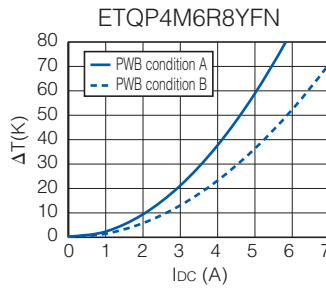
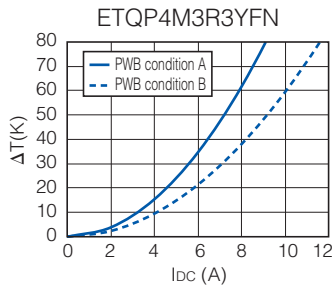
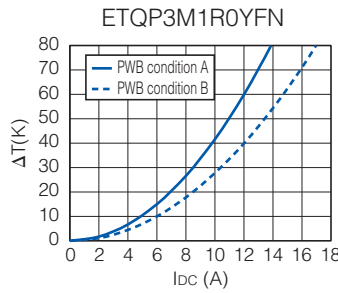
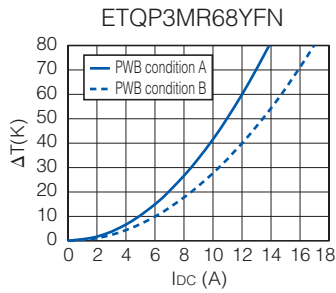
### ● Inductance vs DC Current



● 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-M0754M/PCC-M0750M (ETQP5M□□□YFM/ETQP5M□□□YGM)

#### Standard Parts

Series	Part No.	Inductance *1		DCR (at 20 °C) (mΩ)		Rated Current (Typ. : A)		
		L0 (μH)	Tolerance (%)	Typ. (max.)	Tolerance (%)	ΔT=40K		ΔL=-30%
						(*2)	(*3)	(*4)
PCC-M0754M [7.5×7.0×5.4(mm)]	ETQP5M4R7YFM	4.7	±20	20.00 ( 23.00)	±10	6.3	8.0	13.1
	ETQP5M6R8YFM	6.8		26.70 ( 29.40)		5.5	6.9	12.1
	ETQP5M100YFM	10		37.60 ( 41.30)		4.7	5.7	10.6
	ETQP5M220YFM	22		92.00 (102.00)		3.0	3.7	5.8
	ETQP5M330YFM	33		120.00 (132.00)		2.6	3.3	4.8
	ETQP5M470YFM	48		156.00 (172.00)		2.3	2.9	4.1
PCC-M0750M [7.5×7.0×5.0(mm)]	ETQP5M101YGM	95		348.00 (382.80)		1.4	1.9	3.1

(\*1) Measured at 100 kHz.

(\*2) DC current which causes temperature rise of 40 K. 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 40 K. Parts are soldered by reflow on multilayer PWB with high heat dissipation performance. Note: Heat radiation constant is approx. 31 K/W measured on 7.5×7.0×5.4 mm case size and approx. 29 K/W measured on 7.5×7.0×5.0 mm case size. See also (\*5)

(\*4) Saturation rated current : DC current which causes L(0) drop -30 %.

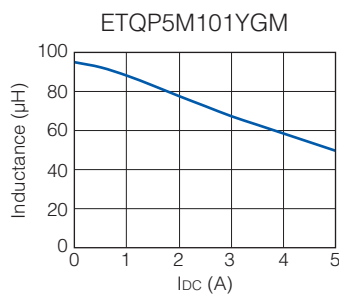
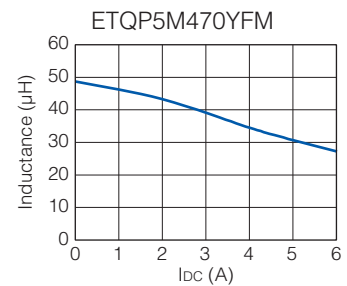
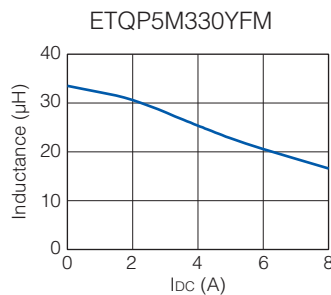
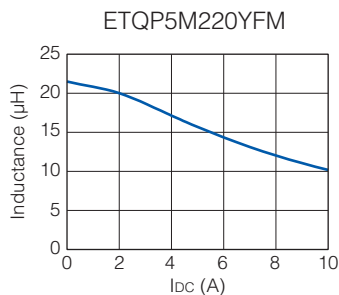
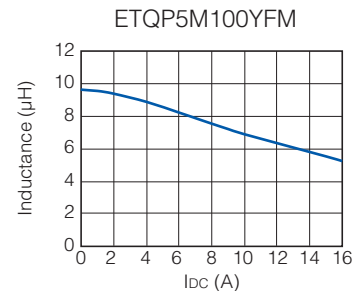
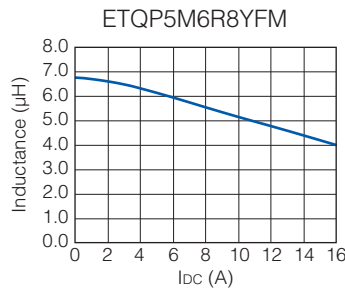
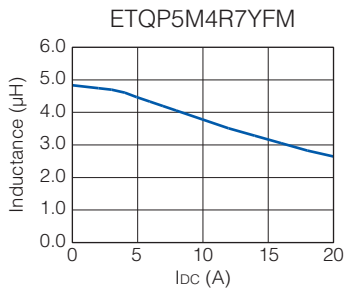
(\*5) Within a suitable application, the part's temperature depends on circuit design and certain heat dissipation conditions. This should be double checked in a worst case operation mode.

In normal case, the max.standard operating temperature of +150 °C should not be exceeded.

For higher operating temperature conditions, please contact Panasonic representative in your area.

#### Performance Characteristics (Reference)

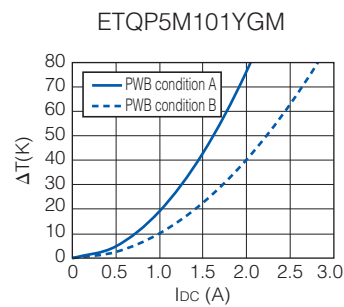
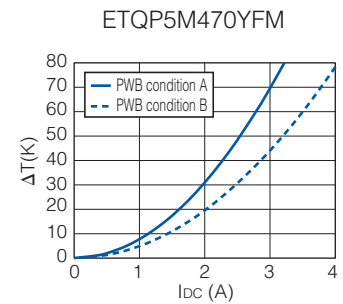
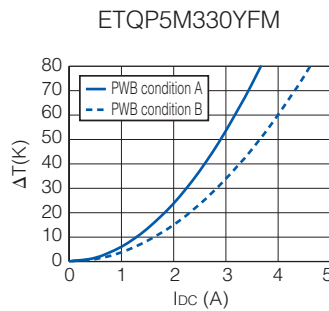
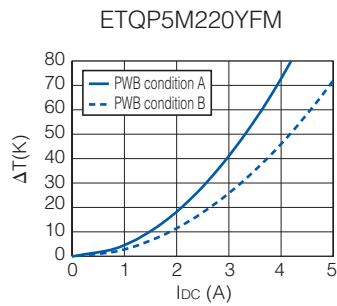
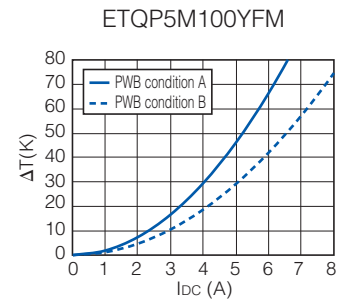
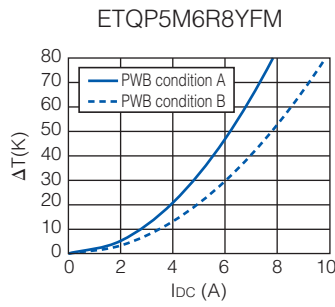
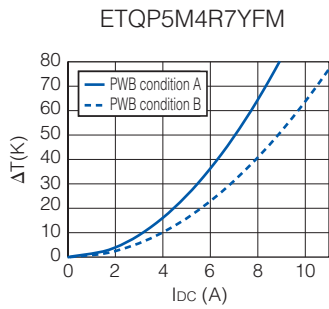
##### ● Inductance vs DC Current



● 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-M0854M/PCC-M0850M (ETQP5M□□□YFK/ETQP5M□□□YGK)

### Standard Parts

Series	Part No.	Inductance *1		DCR (at 20 °C) (mΩ)		Rated Current (Typ. : A)		
		L0 (μH)	Tolerance (%)	Typ. (max.)	Tolerance (%)	ΔT=40K		ΔL=-30% (*4)
						(*2)	(*3)	
PCC-M0854M [8.5×8.0×5.4(mm)]	ETQP5M2R5YFK	2.5	±20	7.60 ( 8.40)	±10	11.9	14.0	20.1
	ETQP5M100YFK	10		33.00 ( 37.00)		5.7	6.7	13.0
	ETQP5M150YFK	15		48.20 ( 53.10)		4.7	5.5	7.2
	ETQP5M220YFK	22		63.00 ( 70.00)		4.1	4.8	6.9
	ETQP5M470YFK	48		125.00 (138.00)		2.9	3.4	5.4
PCC-M0850M [8.5×8.0×5.0(mm)]	ETQP5M101YGK	100		302.00 (333.00)		1.7	2.1	3.0

(\*1) Measured at 100 kHz.

(\*2) DC current which causes temperature rise of 40 K. 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 40 K. Parts are soldered by reflow on multilayer PWB with high heat dissipation performance. Note: Heat radiation constant are approx. 27 K/W measured on 8.5×8.0×5.4 mm case size and approx. 29 K/W measured on 8.5×8.0×5.0 mm case size. See also (\*5)

(\*4) Saturation rated current : DC current which causes L(0) drop -30 %.

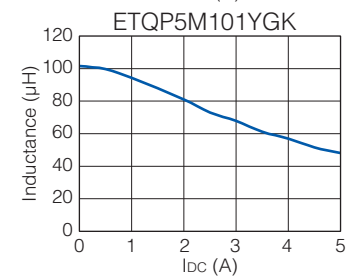
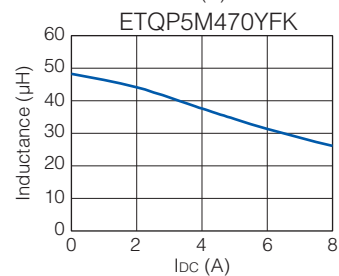
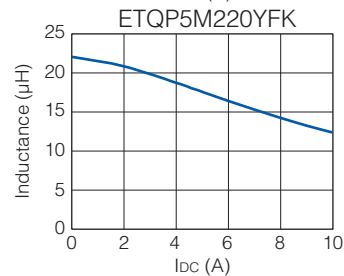
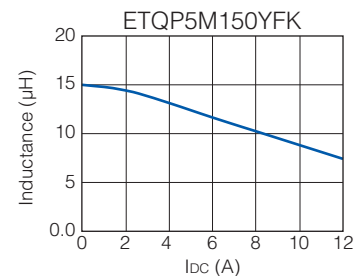
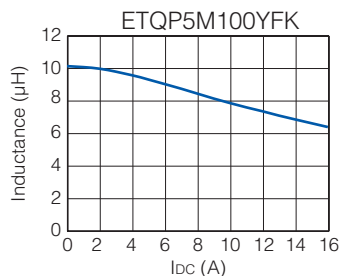
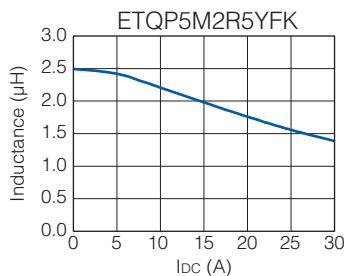
(\*5) Within a suitable application, the part's temperature depends on circuit design and certain heat dissipation conditions. This should be double checked in a worst case operation mode.

In normal case, the max.standard operating temperature of + 150 °C should not be exceeded.

For higher operating temperature conditions, please contact Panasonic representative in your area.

### Performance Characteristics (Reference)

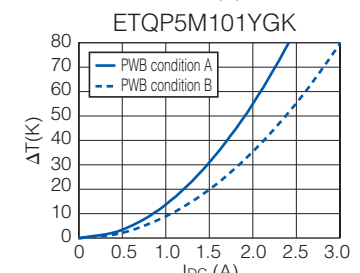
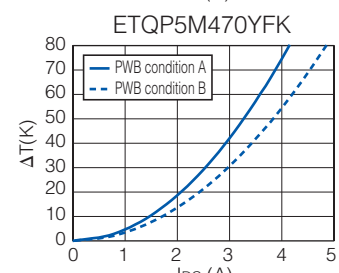
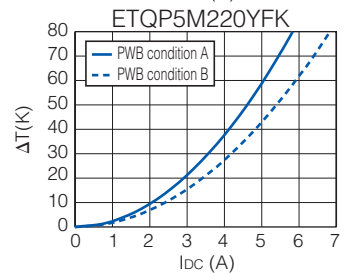
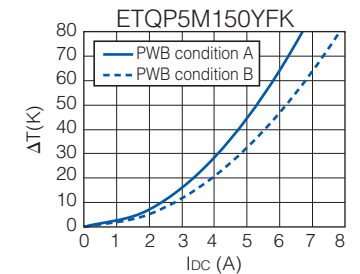
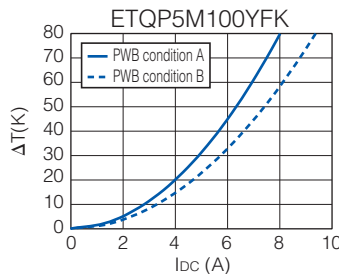
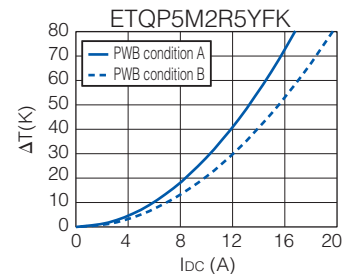
#### ● Inductance vs DC Current



#### ● 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)



## 5. Series PCC-M1054M/PCC-M1050M (ETQP5M□□□YFC/ETQP5M□□□YGC)

### Standard Parts

Series	Part No.	Inductance *1		DCR (at 20 °C) (mΩ)		Rated Current (Typ. : A)		
		L0 (μH)	Tolerance (%)	Typ. (max.)	Tolerance (%)	ΔT=40K (*2)	ΔT=40K (*3)	ΔL=-30% (*4)
PCC-M1054M [10.7×10.0×5.4(mm)]	ETQP5M1R5YFC	1.45	±20	3.80 ( 4.20)	±10	17.9	21.4	35.1
	ETQP5M2R5YFC	2.5		5.30 ( 5.90)		15.1	18.1	27.2
	ETQP5M3R3YFC	3.3		7.10 ( 7.90)		13.1	15.7	22.7
	ETQP5M4R7YFC	4.7		10.20 ( 11.30)		10.9	13.1	20.0
	ETQP5M100YFC	10		23.80 ( 26.20)		7.1	8.5	10.7
	ETQP5M150YFC	15		35.60 ( 39.16)		5.8	7.0	12.0
	ETQP5M220YFC	22		45.00 ( 50.00)		5.2	6.2	8.8
	ETQP5M330YFC	32.5		68.50 ( 75.40)		4.2	5.0	7.6
	ETQP5M470YFC	47		99.00 (108.90)		3.5	4.2	6.8
PCC-M1050M [10.7×10.0×5.0(mm)]	ETQP5M680YFC	66		136.00 (149.60)		3.0	3.6	4.9
	ETQP5M101YGC	97		208.00 (229.00)		2.2	2.7	3.0

(\*1) Measured at 100 kHz.

(\*2) DC current which causes temperature rise of 40 K. 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 40 K. Parts are soldered by reflow on multilayer PWB with high heat dissipation performance. Note: Heat radiation constant are approx. 23 K/W measured on 10.7×10.0×5.4 mm case size and approx. 26 K/W measured on 10.7×10.0×5.0 mm case size. See also (\*5)

(\*4) Saturation rated current : Dc current which causes L(0) drop -30 %.

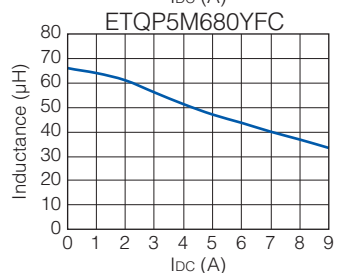
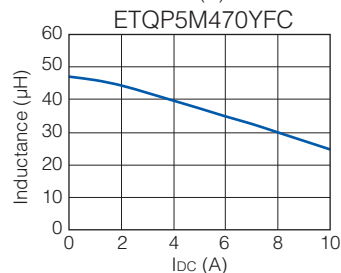
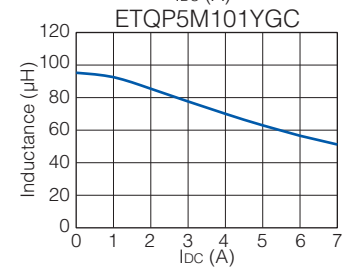
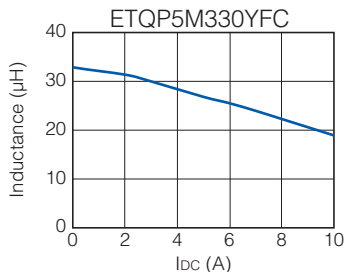
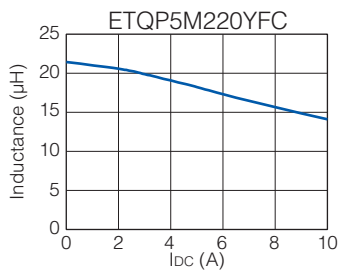
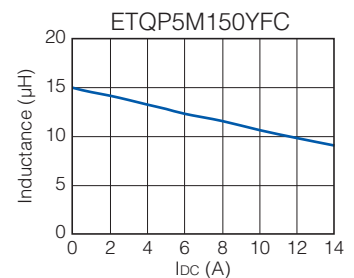
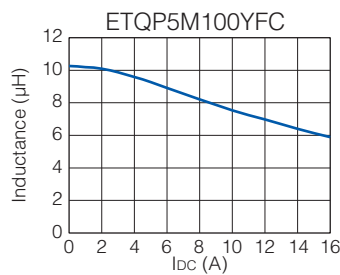
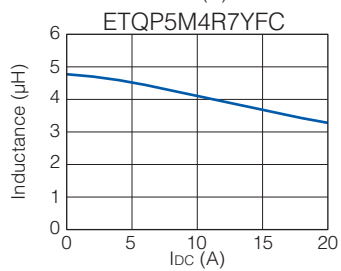
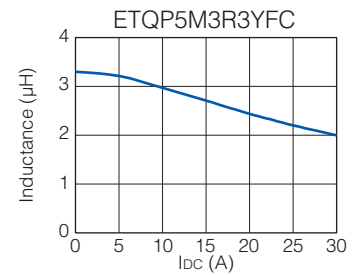
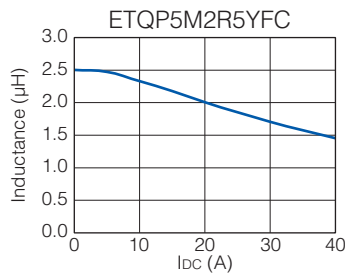
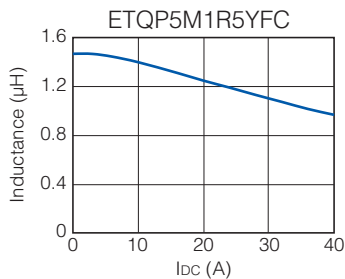
(\*5) Within a suitable application, the part's temperature depends on circuit design and certain heat dissipation conditions. This should be double checked in a worst case operation mode.

In normal case, the max.standard operating temperature of +150 °C should not be exceeded.

For higher operating temperature conditions, please contact Panasonic representative in your area.

### Performance Characteristics (Reference)

#### ● Inductance vs DC Current

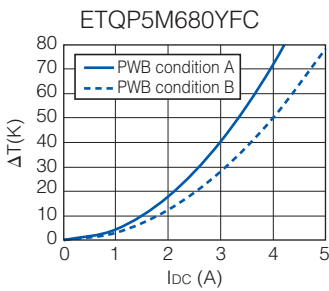
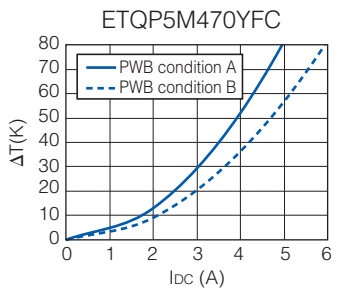
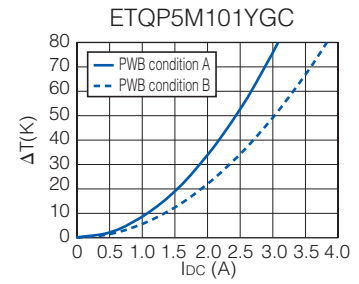
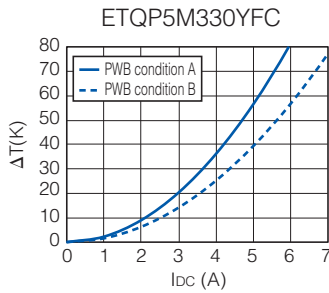
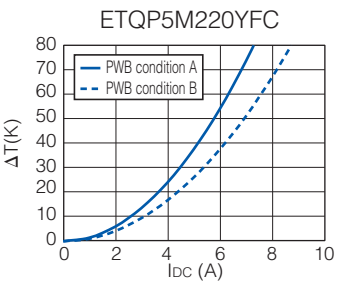
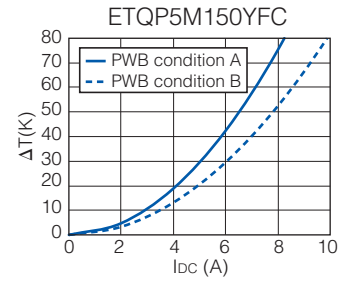
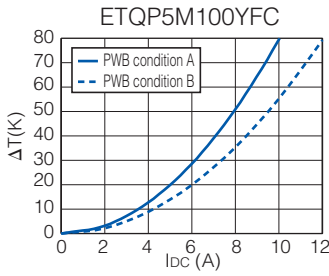
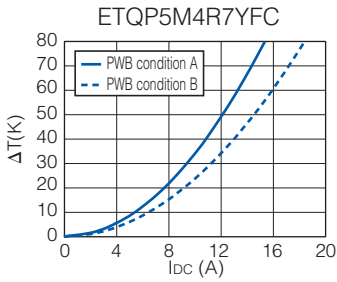
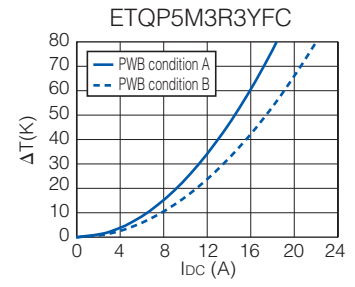
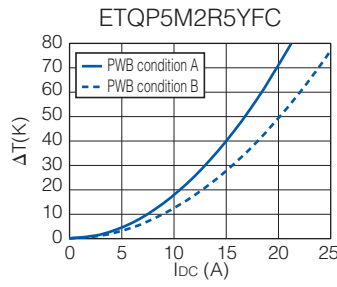
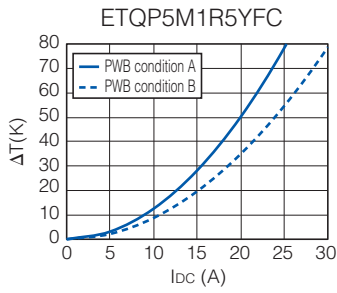




● Case Temperature vs DC Current

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)



## 6. Series PCC-M1050ML/PCC-M1060ML (ETQP5M□□□YLC/ETQP6M□□□YLC)

### Standard Parts

Series	Part No.	Inductance *1		DCR (at 20 °C) (mΩ)		Rated Current (Typ. : A)		
		L0 (μH)	Tolerance (%)	Typ. (max.)	Tolerance (%)	ΔT=40K (*2)	ΔL=-30% (*3)	ΔL=-30% (*4)
PCC-M1050ML [10.9×10.0×5.0(mm)]	ETQP5MR33YLC	0.33	±20	1.10 (1.21)	±10	33.2	39.7	56.7
	ETQP5MR68YLC	0.68		1.75 (1.93)		26.3	31.5	40.0
	ETQP5M1R0YLC	1.0		2.30 (2.53)		23.0	27.5	37.8
	ETQP5M2R0YLC	2.0		4.60 (5.06)		16.2	19.4	31.3
PCC-M1060ML [10.9×10.0×6.0(mm)]	ETQP6M1R5YLC	1.5	±20	3.20 (3.52)	±10	19.5	23.3	32.0
	ETQP6M2R5YLC	2.5		4.55 (5.00)		16.3	19.6	25.8
	ETQP6M3R3YLC	3.3		6.00 (6.60)		14.2	17.0	26.3
	ETQP6M4R7YLC	4.7		8.70 (9.57)		11.8	14.1	22.5

(\*1) Measured at 100 kHz.

(\*2) DC current which causes temperature rise of 40 K. 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 40 K. Parts are soldered by reflow on multilayer PWB with high heat dissipation performance. Note: Heat radiation constant are approx. 23 K/W measured on 10.9×10.0×5.0 mm case size and approx. 23 K/W measured on 10.9×10.0×6.0 mm case size. See also (\*5)

(\*4) Saturation rated current : Dc current which causes L(0) drop -30 %.

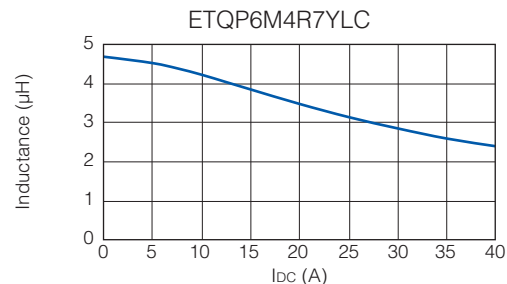
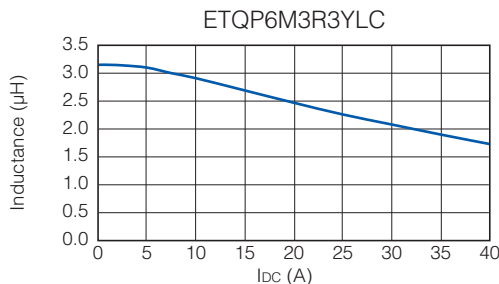
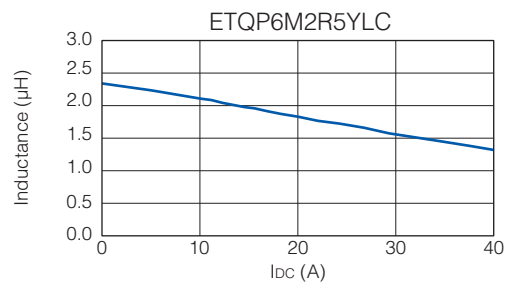
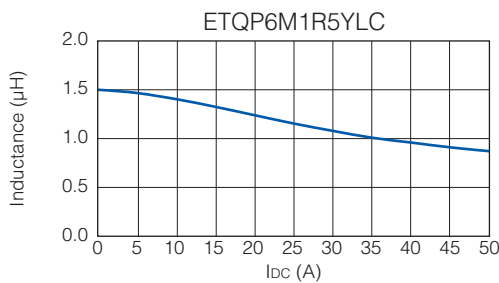
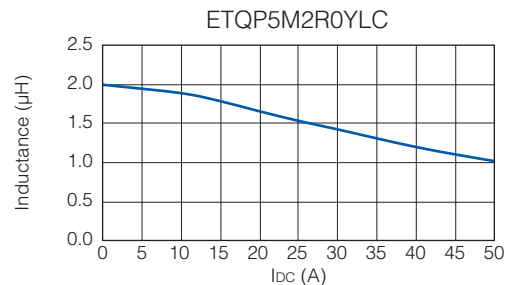
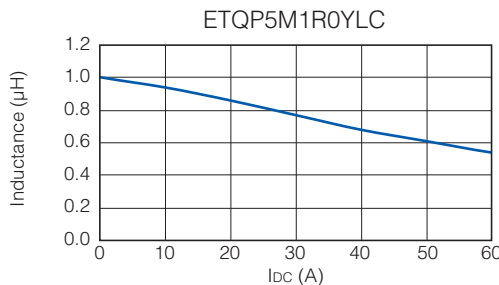
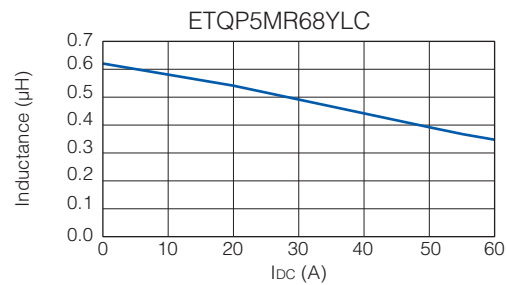
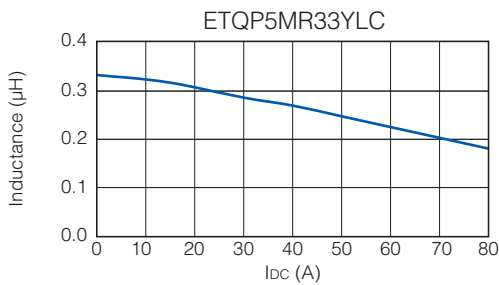
(\*5) Within a suitable application, the part's temperature depends on circuit design and certain heat dissipation conditions. This should be double checked in a worst case operation mode.

In normal case, the max.standard operating temperature of +150 °C should not be exceeded.

For higher operating temperature conditions, please contact Panasonic representative in your area.

### Performance Characteristics (Reference)

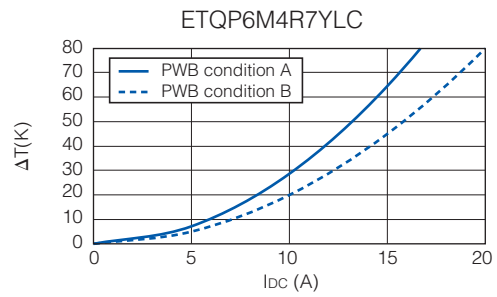
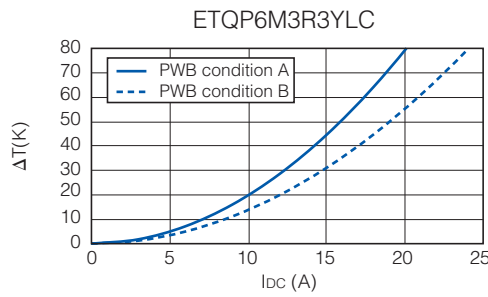
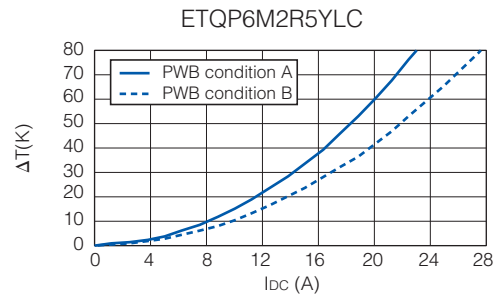
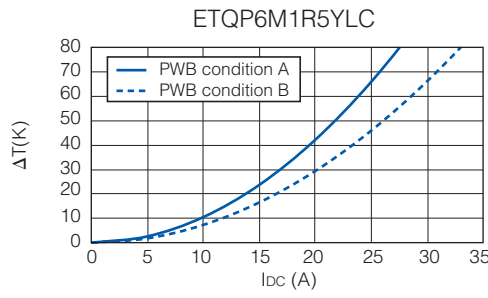
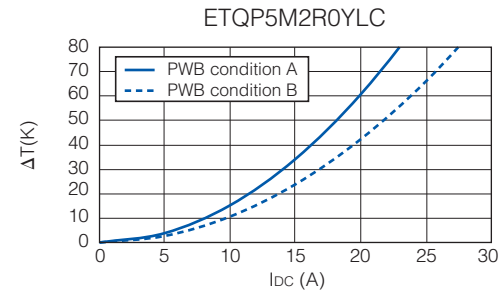
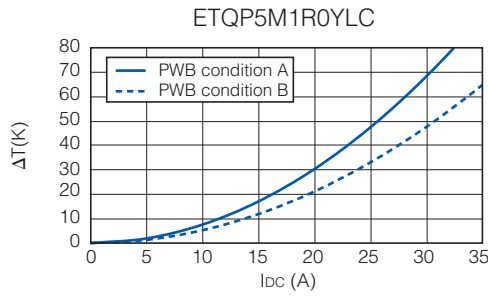
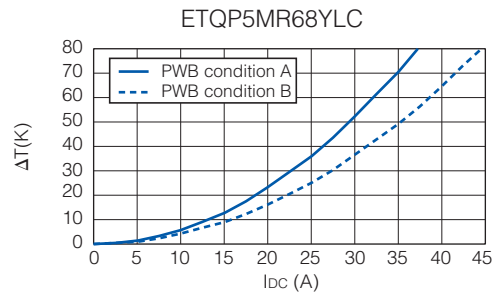
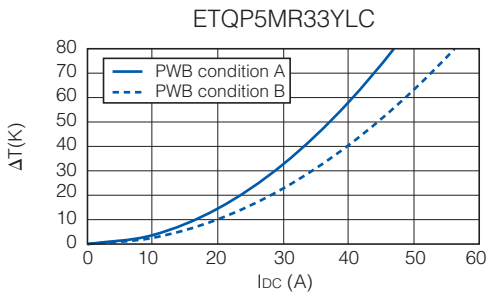
#### ● Inductance vs DC Current



● Case Temperature vs DC Current

PWB condition A : Four-layer PWB (1.6 mm FR4), See also (\*2)

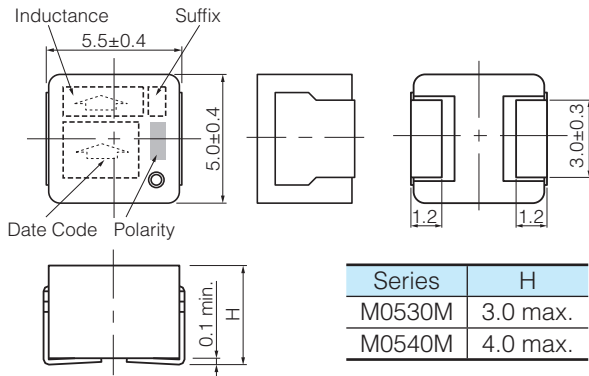
PWB condition B : Multilayer PWB with high heat dissipation performance. See also (\*3)



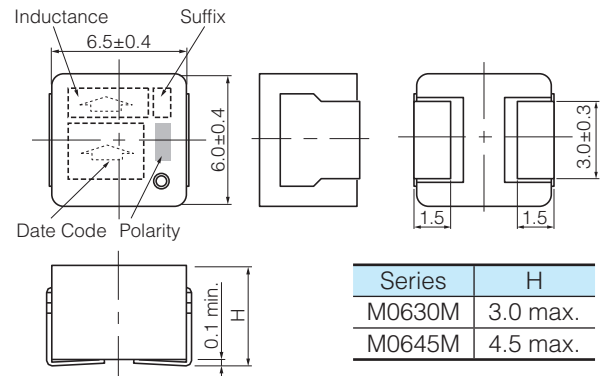
## Dimensions in mm (not to scale)

Dimensional tolerance unless noted :  $\pm 0.5$

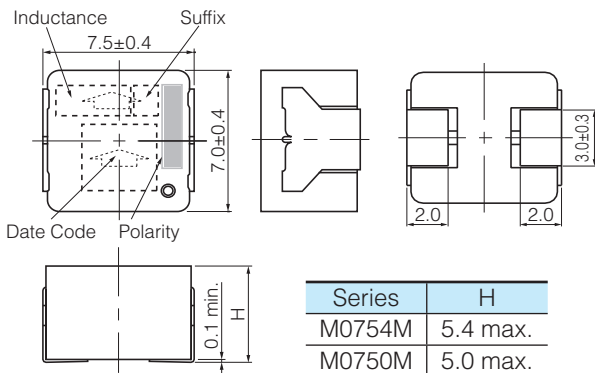
Series PCC-M0530M  
Series PCC-M0540M  
(ETQP3M□□□YFP/ETQP4M□□□YFP)



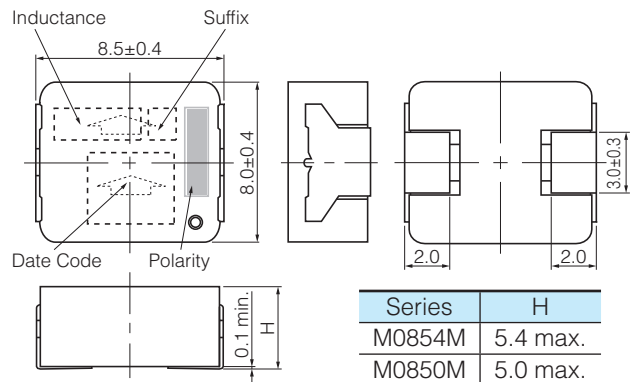
Series PCC-M0630M  
Series PCC-M0645M  
(ETQP3M□□□YFN/ETQP4M□□□YFN)



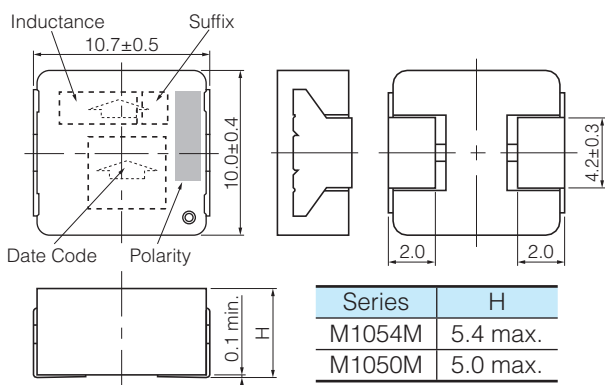
Series PCC-M0754M  
Series PCC-M0750M  
(ETQP5M□□□YFM/YGM)



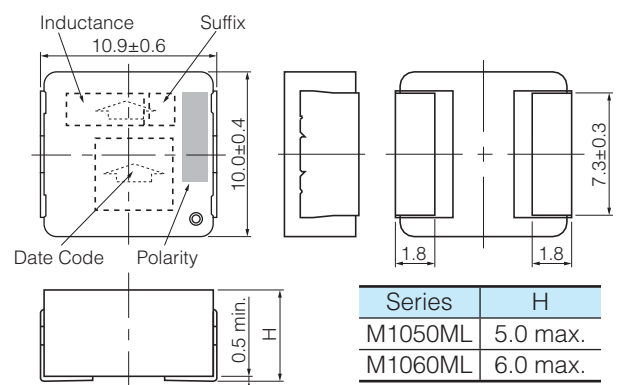
Series PCC-M0854M  
Series PCC-M0850M  
(ETQP5M□□□YFK/YGK)



Series PCC-M1054M  
Series PCC-M1050M  
(ETQP5M□□□YFC/YGC)



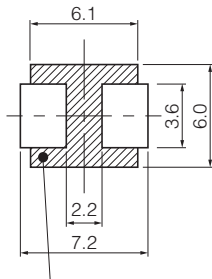
Series PCC-M1050ML  
Series PCC-M1060ML  
(ETQP5M□□□YLC/ETQP6M□□□YLC)



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

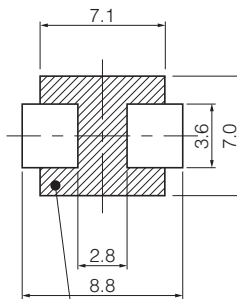
Dimensional tolerance unless noted :  $\pm 0.5$

Series PCC-M0530M  
Series PCC-M0540M  
(ETQP3M□□□YFP/ETQP4M□□□YFP)



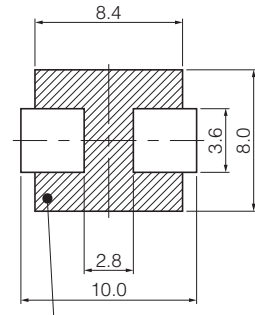
Don't wire on the pattern on shaded portion the PWB.

Series PCC-M0630M  
Series PCC-M0645M  
(ETQP3M□□□YFN/ETQP4M□□□YFN)



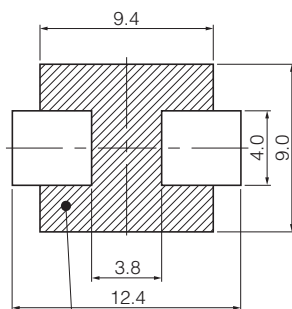
The same as the left.

Series PCC-M0754M  
Series PCC-M0750M  
(ETQP5M□□□YFM/YGM)



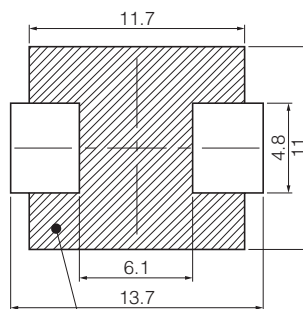
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Series PCC-M0854M  
Series PCC-M0850M  
(ETQP5M□□□YFK/YGK)



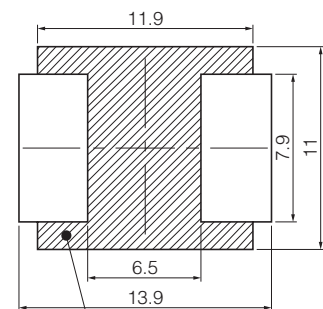
Don't wire on the pattern on shaded portion the PWB.

Series PCC-M1054M  
Series PCC-M1050M  
(ETQP5M□□□YFC/YGC)



The same as the left.

Series PCC-M1050ML  
Series PCC-M1060ML  
(ETQP5M□□□YLC/ETQP6M□□□YLC)



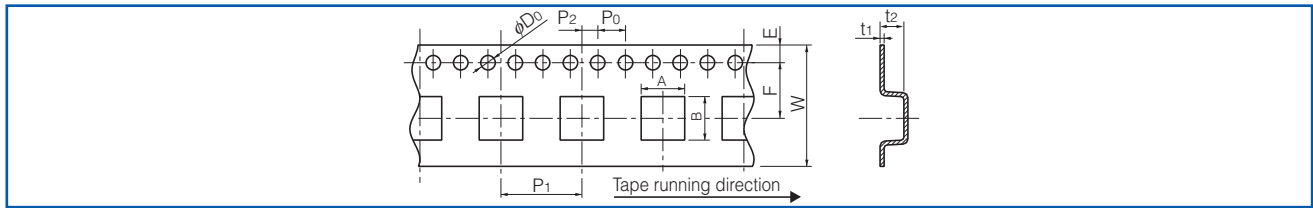
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## ■ As for Soldering Conditions and Safety Precautions (Power Choke Coils (Automotive Grade)),

Please see Data Files

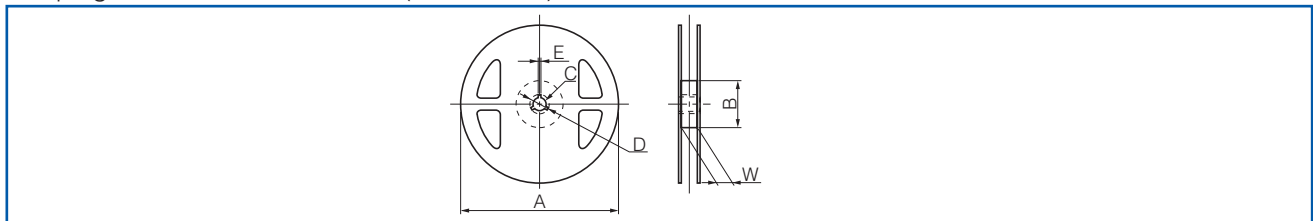
## Packaging Methods (Taping)

- 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	5.6	6.1	16.0	1.75	7.5	12.0	2.0	4.0	1.5	0.4	3.3
PCC-M0540M											4.3
PCC-M0630M	7.1	6.6									3.3
PCC-M0645M											5.0
PCC-M0754M/M0750M	8.1	7.6									6.0
PCC-M0854M/M0850M	9.1	8.6									6.0
PCC-M1054M/M1050M PCC-M1050ML/M1060ML	10.7	11.9	24.0	11.5	16.0	0.5	6.3				

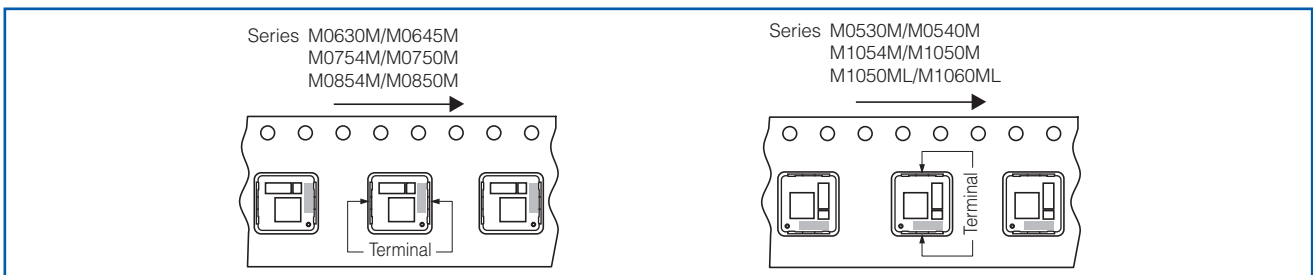
- Taping Reel Dimensions in mm (not to scale)



### Standard Reel Dimensions

Series	A	B	C	D	E	W
PCC-M0530M/M0540M PCC-M0630M/M0645M PCC-M0754M/M0750M PCC-M0854M/M0850M	330	100	13	21	2	17.5
PCC-M1054M/M1050M PCC-M1050ML/M1060ML						25.5

## Component Placement (Taping)



## Standard Packing Quantity/Reel

Series	Part No.	Minimum Quantity / Packing Unit	Quantity per reel
PCC-M0530M	ETQP3M□□□YFP	2,000 pcs. / box (2 reel)	1,000 pcs.
PCC-M0540M	ETQP4M□□□YFP		
PCC-M0630M	ETQP3M□□□YFN		
PCC-M0645M	ETQP4M□□□YFN	1,000 pcs. / box (2 reel)	500 pcs.
PCC-M0754M	ETQP5M□□□YFM		
PCC-M0750M	ETQP5M□□□YGM		
PCC-M0854M	ETQP5M□□□YFK		
PCC-M0850M	ETQP5M□□□YGK		
PCC-M1054M	ETQP5M□□□YFC		
PCC-M1050M	ETQP5M□□□YGC		
PCC-M1050ML	ETQP5M□□□YLC		
PCC-M1060ML	ETQP6M□□□YLC		