

Metal Composite Type Power Choke Coils

AEC-Q200 Compliant For Use
In Harsh Environments

- › Vibration Resistance of 10G ~ 30G (5Hz – 2kHz)
- › Maximum Operating Temperature of 150°C
- › Up to 40% Smaller 25% Lighter
- › Thermal Shock -40°C to +150°C
- › Metal Composite Core with Magnetic Shielding
- › Soft Saturation



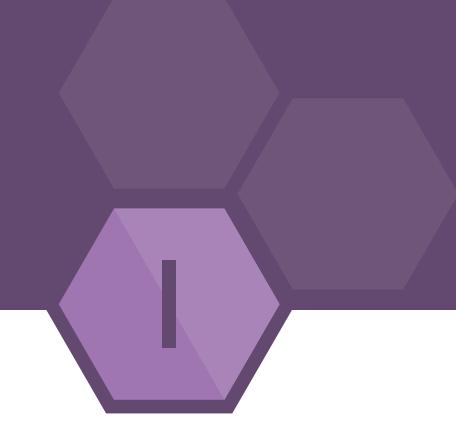


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Overview

Product List And Main Applications

Series	Standard	LP / LE	Anti-vibration	4x4 mm	12x12 mm	15x15 mm
Appearance						
Status	MP*	MP*	MP* (Partially)	Coming Soon	MP*	Coming Soon
Size (mm)	5x5 to 10x10	5x5 to 10x10	8x8 to 10x10	4x4	12x12	15x15
L (μH)	0.33 to 100	0.19 to 100	0.68 to 47	0.1 to 4.7	0.33 to 4.7	0.33 to 4.7
I (A)	1.4 to 33.2	1.6 to 32.5	2.9 to 26.3	2.3 to 10.0	16.8 to 44.4	27 to 73
DCR (mΩ)	3.8 to 348	0.9 to 206	1.75 to 125	5.8 to 106.7	0.7 to 4.9	0.4 to 3.0
Vibration (G)	10 to 30	4.4 to 30	30 to 50	10	30	30
Power- train	Engine	✓ ✓				
	Transmission	✓ ✓	✓	✓ ✓		
	Pump	✓ ✓	✓	✓ ✓	✓ ✓	✓ ✓
	Cooling Fan	✓			✓ ✓	✓ ✓
EV, HEV, PHV	BMS		✓ ✓		✓	
	Inverter	✓	✓ ✓			
	OBC		✓ ✓			
	48 V DC-DC	✓			✓ ✓	✓ ✓
	Brake, ABS	✓		✓ ✓	✓	✓
Body, Chassis & Safety	Steering, EPS	✓			✓ ✓	✓ ✓
	BCM	✓	✓ ✓		✓	
	Power Window	✓	✓ ✓		✓	
	Lighting	✓	✓ ✓			
	DCU	✓	✓		✓ ✓	✓
	Camera	✓	✓		✓ ✓	✓
AD / ADAS	Rader	✓	✓		✓ ✓	
	Lidar	✓	✓		✓ ✓	
	T-Box	✓	✓		✓ ✓	

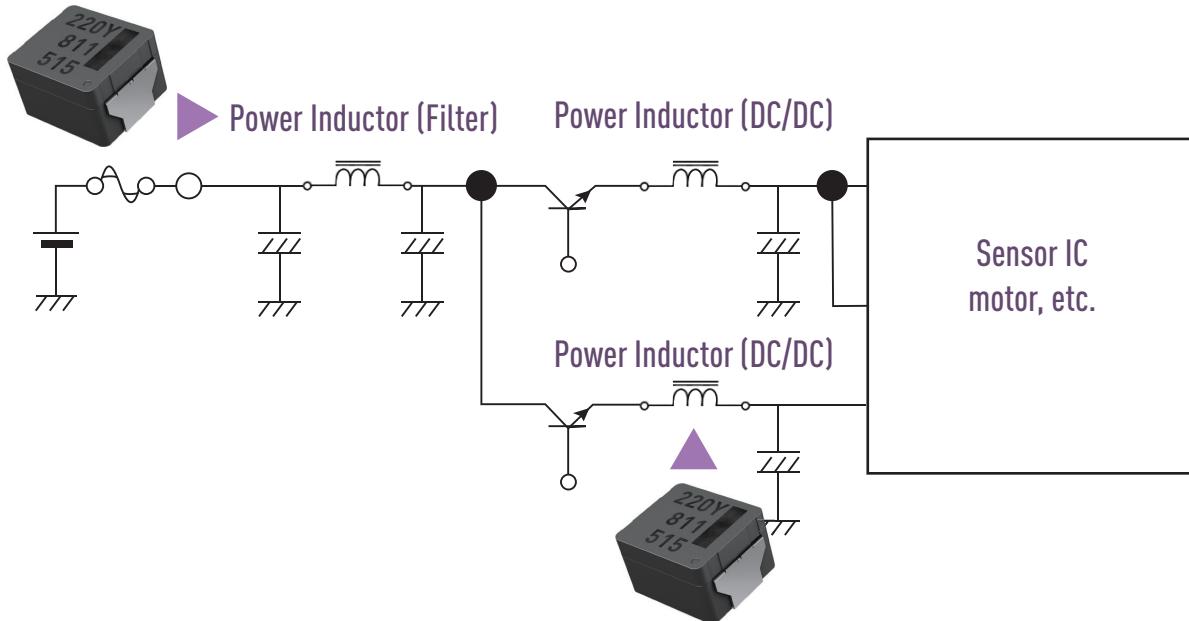
*Mass Production

✓ : Recommended
✓ ✓ : Strongly Suggested

Introduction

Panasonic's ETQ-PM Series Metal Composite Type Power Choke Coils are suited for filter, step-down and step-up circuits for DC/DC converters. They are AEC-Q200 Compliant offering reliability when exposed to high temperatures along with a high tolerance to vibration.

DC / DC Converter Application Example

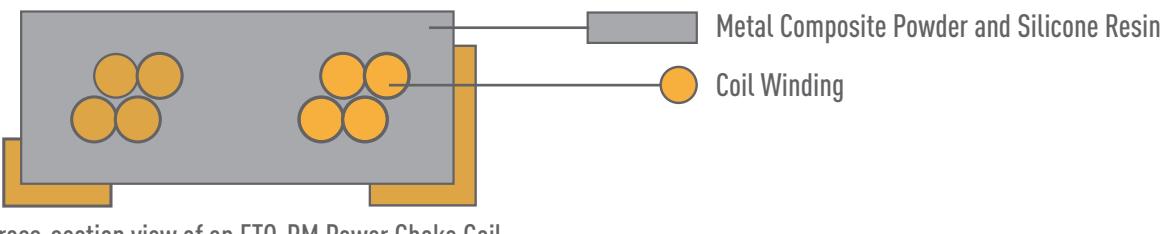


Applications

- Noise Filter For Drive Circuits
- DC/DC Converter
- Voltage Regulator
- Buck/Boost Converters
- Server
- Router
- CPU Drive
- Notebook, Tablet
- Power Supply Module
- LED Driver
- HEV/EV
- Engine ECU
- ADAS
- Power Train

Features And Benefits

High Current, High Heat Resistance and Excellent Thermal Stability

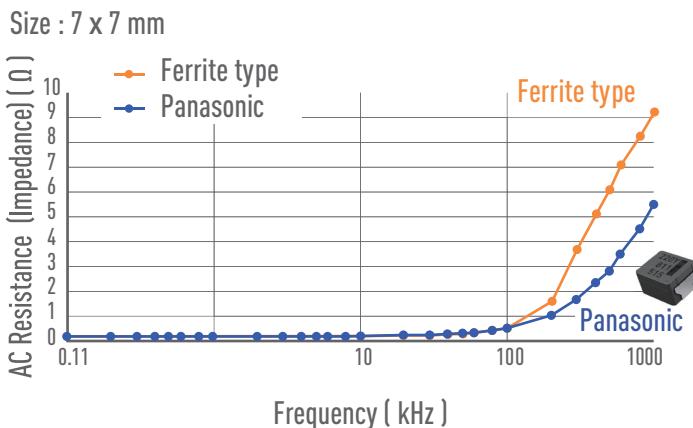


Cross-section view of an ETQ-PM Power Choke Coil.

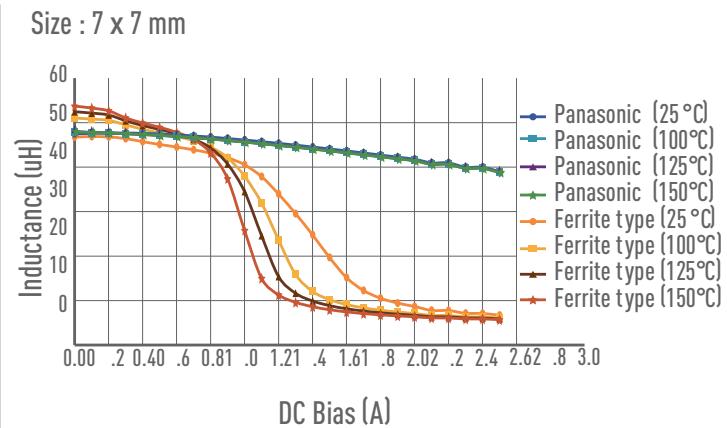
- The ETQ-PM Power Inductor consists of metal powder, silicone resin and coil winding. The magnetic material, which is created from Fe-based powder, enables high current, high heat resistance and excellent thermal stability.
- Excellent magnetic saturation characteristics (i.e. Ferrite core = 0.4T vs. Metal Composite Type=above 1.5T) make it difficult to magnetically saturate, resulting in good inductance vs. current performance without substantial drop off.
- By using a high temperature capable resin material, an operating temperature up to 150°C is achievable.

For higher maximum operating temperature options in high volume applications, please [contact us](#).

Frequency Characteristics of AC Resistance



Effect of DC Bias Current on Inductance



The metal composite molded structure has a distributed gap rather than a discrete gap resulting in low AC resistance (impedance) at higher frequencies.

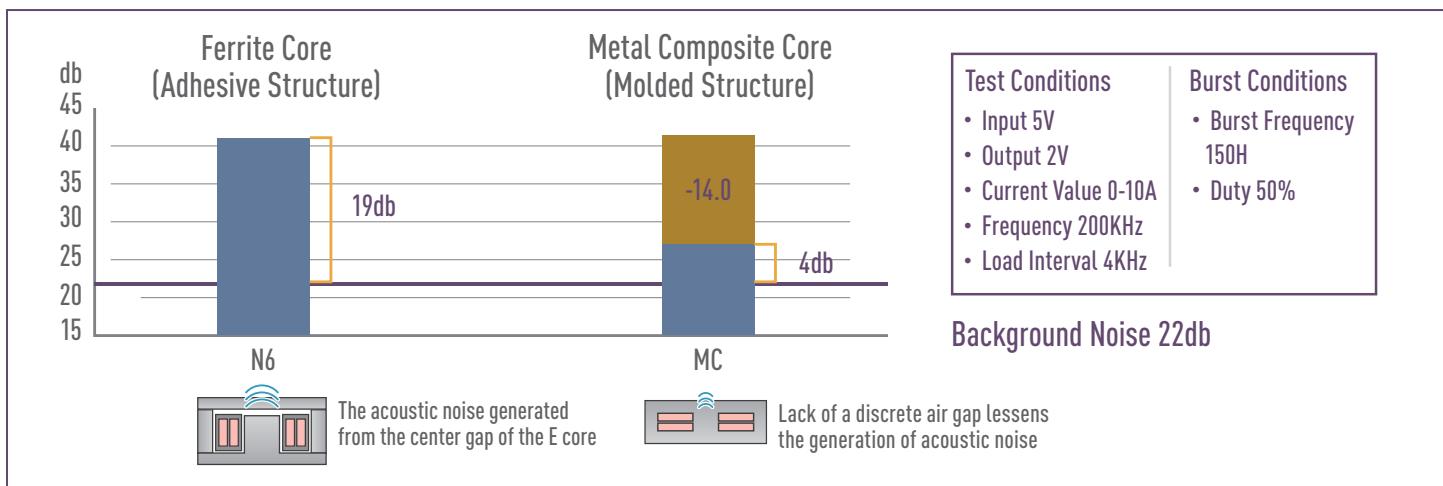
The ETQ-PM Inductor allows for large currents. The inductance levels do not drop significantly as the current increases regardless of the temperature.

Comparison of Panasonic vs. Ferrite Type (At The Same Inductance (Current) Capability)

Manufacturer	Panasonic Metal Composite	Ferrite (Alternative Product)	
Series	M0645	Ferrite Type	
Size (mm)	6.5 × 6.0	7.4 × 6.9	
Height (mm)	4.5 max	4.7 max	
Volume (mm) ³	187	240	Achieved 22% downsizing
Core Material	Metal Composite	Ferrite	
L1 (uH) at 100kHz	47.0 (0.8A)	47.0 (0.7A)	Temperature condition 125°C
ISAT (A) at 125°C , L-10%	1.3	0.7	
DCR (mΩ)	210	158	
Performance Index Per Volume	100%	60%	
Max Operating Temperature	150°C	125°C	

Acoustic Noise Reduction

Troublesome acoustic noise at audible frequencies is reduced by having a distributed gap structure where the resin replaces the air gap. This enables a large reduction of acoustic noise compared to Ferrite Types.



Low Leakage Flux

The integrated molded structure of the Metal Composite Type with its distributed gap has low leakage flux from the core resulting in noise and interference reduction, facilitating high density layouts.

AEC-Q200 Compliant For Use In Harsh Environments

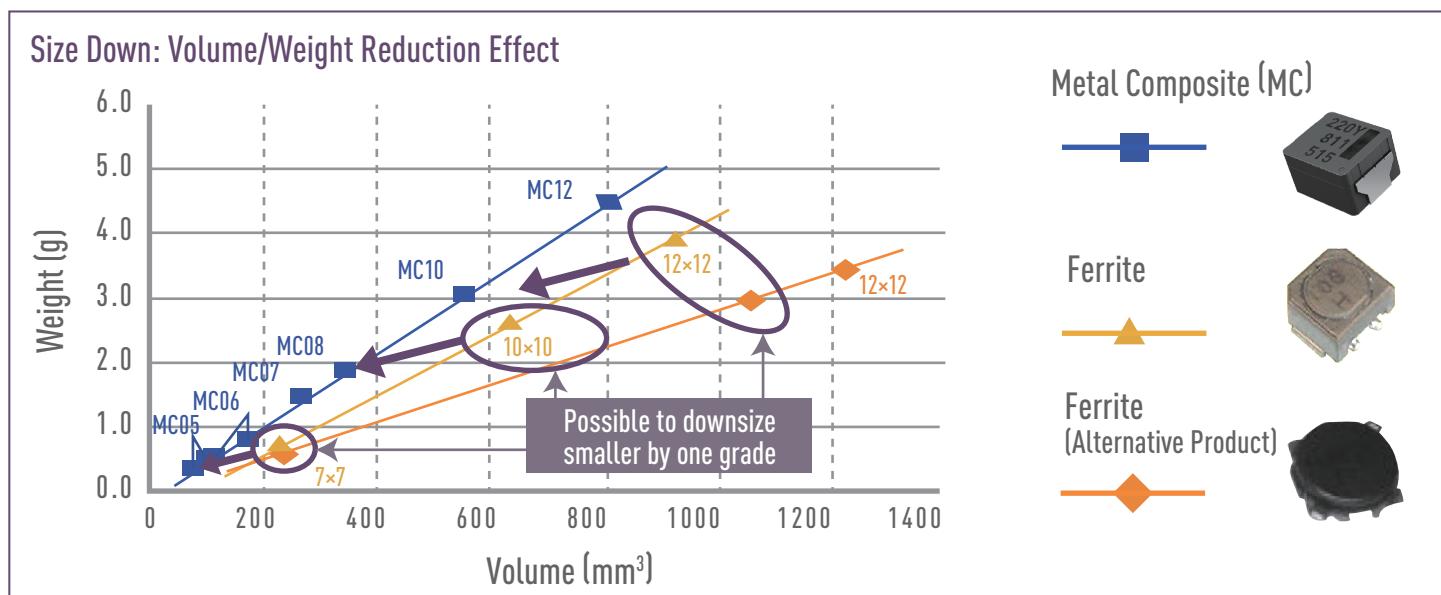
Through the previously mentioned improvements, the ETQ-PM Series product provides 150°C temperature and excellent vibration resistance characteristics.

Reliability Results for AEC-Q200 Compliance

Item	Condition	Time	Remark
Thermal Shock	-40 ~ +150°C (Each for 10 minutes)	2000cycles	
Vibration Resistance	10G ~ 30G (5Hz - 2kHz)	XYZ (Each for 2 hours)	
Heat Resistance	150°C	2000 hours	
High Temperature Lifetime	150°C (Rated current applied)		
Anti-Humidity	85°C, 85%RH	2000 hours	
Anti-Humidity Lifetime Test	85°C, 85%RH (Rated current applied)		
Low Temperature Test	-40°C	2000 hours	

Facilitates Smaller And Lighter Designs

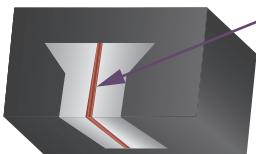
Panasonic Metal Composite Core Types facilitate smaller designs compared with Ferrite Type Choke Coils. Around 20-40% down in size and 5-25% down in weight.



Unique Terminal Structure

The copper wire of the internal coil is brought out directly to the terminal mounting part to ensure the reliability of mounting to the PCB. Other products make the connection inside the Metal Composite, thus it is hard to verify the connection condition and long-term reliability issues may occur with environmental stresses.

Panasonic Metal Composite Type*



The copper wire comes to the surface of the terminals and directly connects to the PCB pattern, thus high mounting reliability is achieved.

Other Company



The copper wire connects to the terminals internally.

*For the actual product, dip solder is applied on the copper wire part.
The corresponding part numbers are included in the Selection Guide on page 8 of this document.

Insulation Voltage Target of Panasonic Power Choke Coils

High performance series (ETQP_M___Y___)

	Size (mm)	Existing Withstand Voltage (V)	Revised Specifications												
			Inductance (μH)												
			0.68	1.0	1.5	2.2/2.5	3.3	4.7	6.8	10	15	22	33	47	68
M0530, M0540	5x5	20						55 V							
M0630, M0645	6x6	25					60 V					55 V			
M0750, M0754	7x7	35						65 V					60 V		
M0850, M0854	8x8	35					70 V						65 V		
M1050, M1054	10x10	35						70 V							65 V
M1050L, M1054L	10x10	35			70 V										

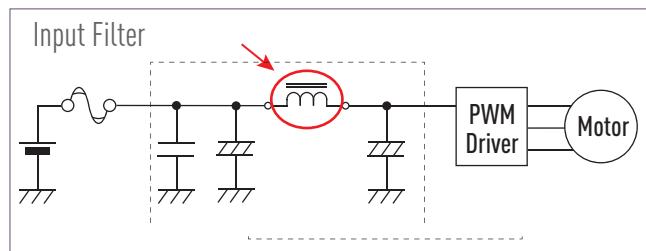
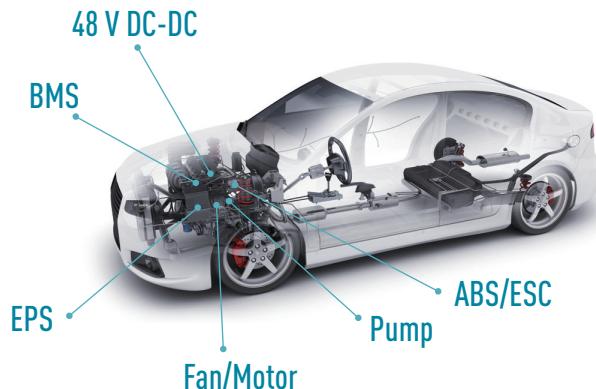
Low profile series (ETQP_M___KV___)

	Size (mm)	Existing Withstand Voltage (V)	Revised Specifications													
			Inductance (μH)													
			0.68	1.0	1.5	2.2/2.5	3.3	4.7	6.8	10	15	22	33	47	68	100
M0530LP	5x5	25				55 V				50 V						
M0630LP	6x6	25				60 V					55 V					
M0840LP	8x8	35					65 V									
M1040LP	10x10	35					65 V							60 V		

For Specific Requirements

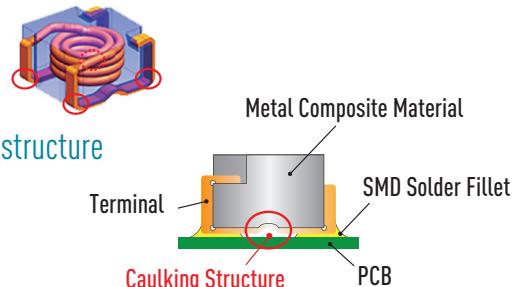
Large Current, Large Size Type (12x12mm)

Target Applications – Filters/DC-DC converters for below applications



Reliability – High vibration resistance by 4-point fixing 30 G / 5 Hz to 2000 Hz

- “Internal coil = Lead wire = terminal” achieves very high reliability electrode structure
- High heat resistance $> 160^{\circ}\text{C}$



Line Up And Benchmark

Other Company		
Alternative Products		
Size : 17.2 x 17.2 x 7.0 (mm)		
LO (μH)	DCR (mΩ)	Rated Current (A) △T: +40 K
4.7	4.90	24
3.3	3.10	32.2
2.2	2.25	38.5
1.5		
1.0	1.36	53.0
0.68		
0.47	0.89	65.0
0.33		



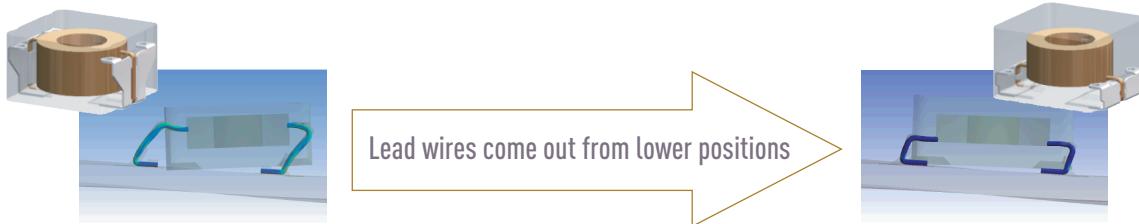
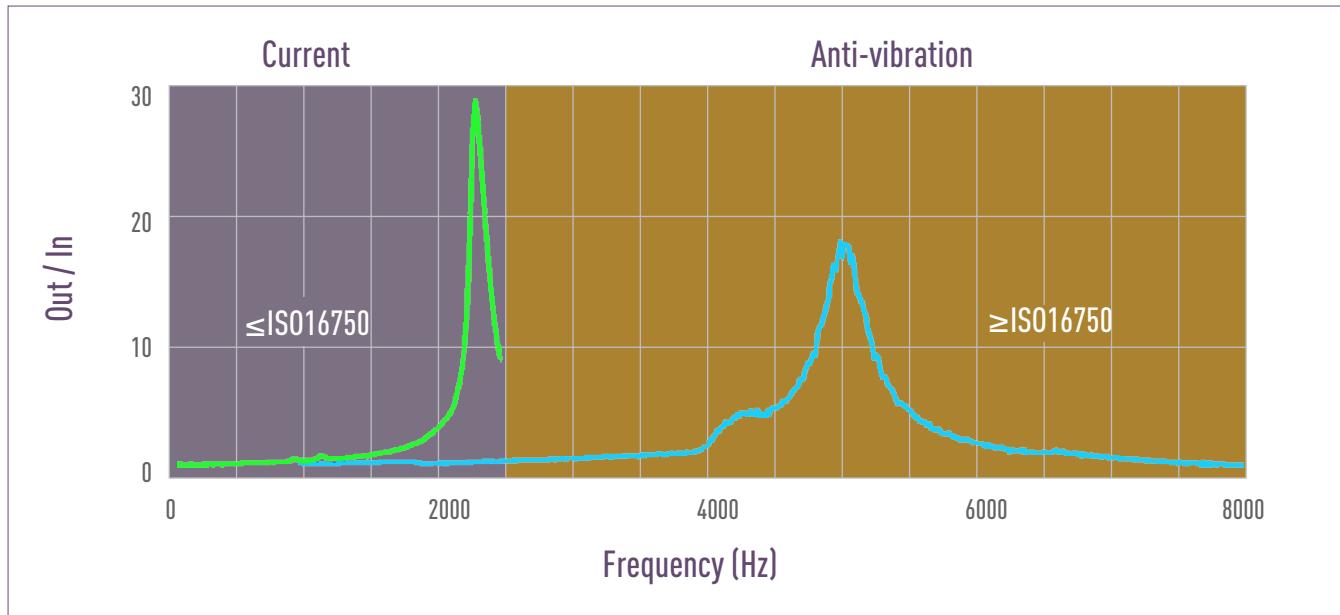
Panasonic			
PCC-M1280MF			
Size : 12.6 x 13.2 x 8.0 (mm)			
LO (μH)	DCR (mΩ)	Rated Current (A) △T: +40 K	Saturation Current (A) △T: +40 K
4.7	4.90	20.2	224.7
3.3	3.10	23.6	27.6
2.2	2.60	27.7	32.1
1.5	1.80	33.3	29.9
1.0	1.36	38.3	44.4
0.68	1.10	42.6	56.9
0.33	.070	53.5	84.5

45% Less Space

High Vibration Resistance Series

Target Applications – Engine direct attachment, mechanical and electrical integration system applications

Reliability – Vibration 30 to 50 G/10⁸ times/150 °C Frequency \leq 2000Hz, SRF \geq 3000Hz

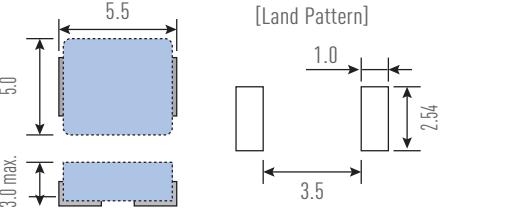


Up ↑ 30G
Down ↓ 50G

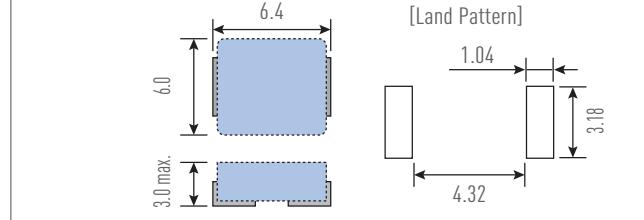
10.9 x 10.0 x H5-6 (mm)			8.5 x 8.0 x H5-6 (mm)		
L ₀ (μH)	DCR (mΩ)	Rated current (A) ΔT: +40 K	L ₀ (μH)	DCR (mΩ)	Rated current (A) ΔT: +40 K
47	99.0	3.50	47	125	2.90
33	68.5	4.20	33	100	3.30
22	45.0	5.20	22	63.0	4.10
10	23.8	7.10	10	33.4	5.70
4.7	8.70	11.8	4.7	16.8	8.00
3.3	6.00	14.2	3.3	9.60	10.6
2.5	4.55	16.3	2.5	7.60	11.9
2.0	4.60	16.2	-	-	-
1.5	3.10	19.8	-	-	-
1.0	2.30	23.0	-	-	-
0.68	1.75	26.3	-	-	-

Low Profile Series

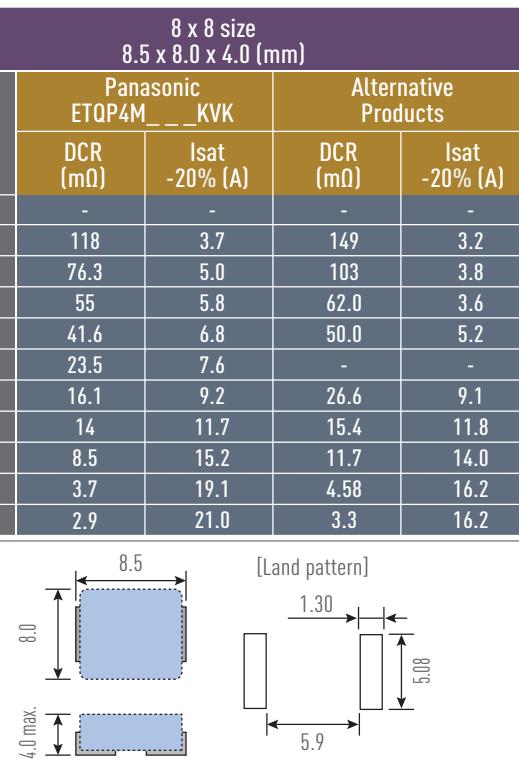
5 x 5 size 5.5 x 5.0 x 3.0 (mm)				
L (μ H)	Panasonic ETQP3M_ _ _ KVP		Alternative Products	
	DCR (m Ω)	Isat -20% (A)	DCR (m Ω)	Isat -20% (A)
47	-	-	-	-
33	-	-	-	-
22	-	-	-	-
10	96.0	3.4	132	1.6
6.8	65.7	4.5	104	2.2
4.7	45.6	5.4	72.8	3.7
3.3	27.3	5.8	44.0	5.5
2.2	20	7.4	24.7	6.3
1.5	12	9.6	18.0	7.1
1.0	9.6	11.4	11.5	8.0
0.68	7.6	11.3	9.1	8.2



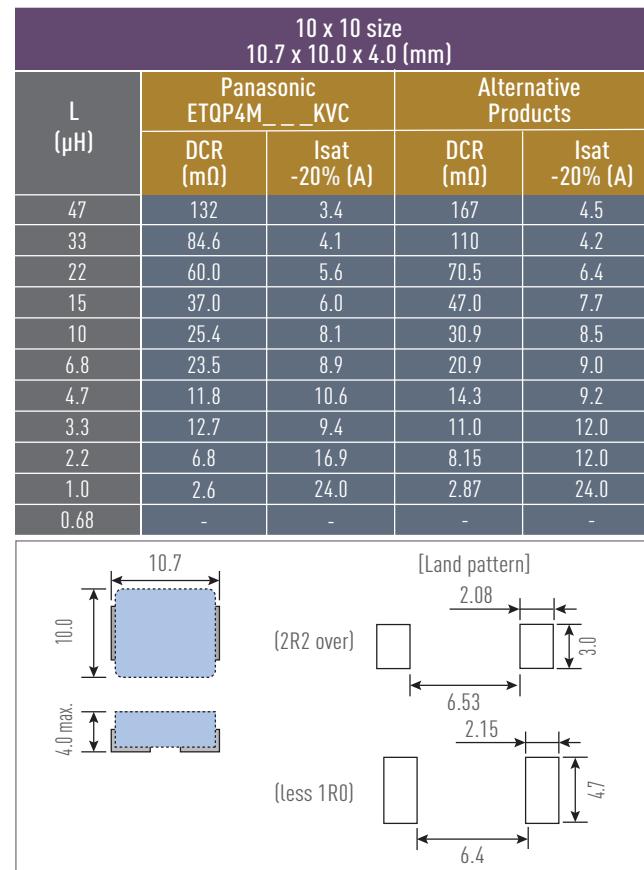
6 x 6 size 6.4 x 6.0 x 3.0 (mm)				
L (μ H)	Panasonic ETQP3M_ _ _ KVN		Alternative Products	
	DCR (m Ω)	Isat -20% (A)	DCR (m Ω)	Isat -20% (A)
47	-	-	-	-
33	-	-	-	-
22	128	2.8	163.0	2.2
10	99.2	3.5	118.0	2.8
6.8	71.0	4.2	71.9	2.9
4.7	45.6	5.5	53.8	4.4
3.3	29	7.2	35.9	5.6
2.2	24.1	7.3	26.5	8.3
1.5	14.5	8.9	17.1	10.8
1.0	6.2	10.7	7.9	13.0
0.68	5.2	11.8	5.38	17.0



8 x 8 size 8.5 x 8.0 x 4.0 (mm)				
L (μ H)	Panasonic ETQP4M_ _ _ KVK		Alternative Products	
	DCR (m Ω)	Isat -20% (A)	DCR (m Ω)	Isat -20% (A)
47	-	-	-	-
33	118	3.7	149	3.2
22	76.3	5.0	103	3.8
15	55	5.8	62.0	3.6
10	41.6	6.8	50.0	5.2
6.8	23.5	7.6	-	-
4.7	16.1	9.2	26.6	9.1
3.3	14	11.7	15.4	11.8
2.2	8.5	15.2	11.7	14.0
1.0	3.7	19.1	4.58	16.2
0.68	2.9	21.0	3.3	16.2



10 x 10 size 10.7 x 10.0 x 4.0 (mm)				
L (μ H)	Panasonic ETQP4M_ _ _ KVC		Alternative Products	
	DCR (m Ω)	Isat -20% (A)	DCR (m Ω)	Isat -20% (A)
47	132	3.4	167	4.5
33	84.6	4.1	110	4.2
22	60.0	5.6	70.5	6.4
15	37.0	6.0	47.0	7.7
10	25.4	8.1	30.9	8.5
6.8	23.5	8.9	20.9	9.0
4.7	11.8	10.6	14.3	9.2
3.3	12.7	9.4	11.0	12.0
2.2	6.8	16.9	8.15	12.0
1.0	2.6	24.0	2.87	24.0
0.68	-	-	-	-



Comparison

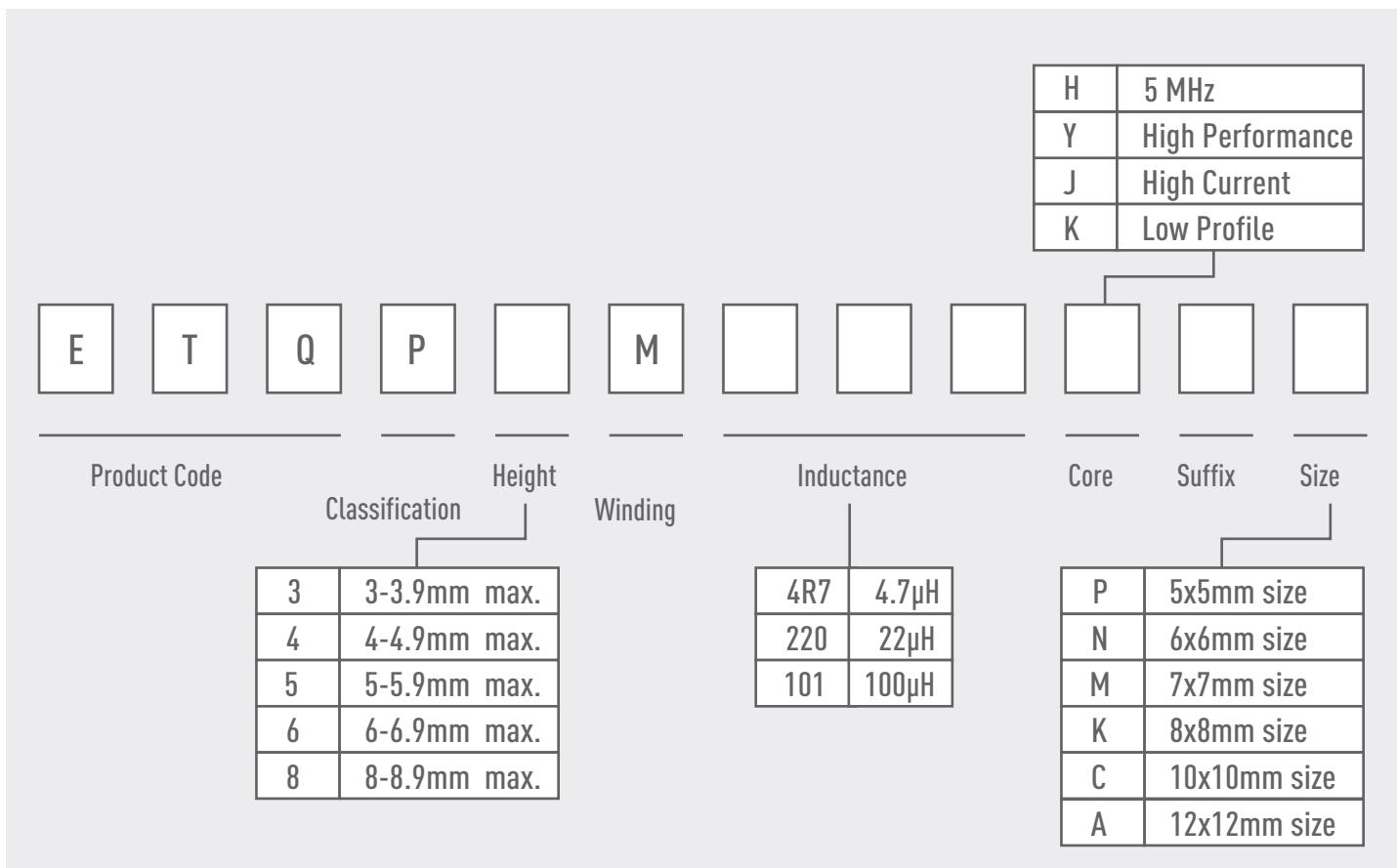
Panasonic's ETQ-PM Series Vs. Alternative Products

With unique metal magnetic material technology, the ETQ-PM Series displays low loss and downsizing compared with alternative products.

Panasonic Vs. Alternative Products						
Manufacturer	Panasonic		Alternative Products	Panasonic		Alternative Products
Power Inductor	8 × 8.5 × 5.4 (mm) ETQ-P5M220YFK	10 × 10.7 × 5.4 (mm) ETQ-P5M220YFC	10 × 10.7 × 4.0 (mm) 22 μ H	8 × 8.5 × 5.4 (mm) ETQ-P5M470YFK	10 × 10.7 × 5.4 (mm) ETQ-P5M470YFC	10 × 10.7 × 4.0 (mm) 47 μ H
Frequency	400kHz	400kHz	400kHz	400kHz	400kHz	400kHz
DCR 20°C	63mΩ	45mΩ	70mΩ	125mΩ	96mΩ	165mΩ
ACR	1190mΩ	861mΩ	1254mΩ	2416mΩ	2171mΩ	2805mΩ
Rated Current	4.33A	4.33A	4.33A	2.47A	2.47A	2.47A
Iac (Ripple)	1.11A	1.11A	1.11A	0.52A	0.52A	0.52A
Idc RMS	4.42A	4.42A	4.42A	2.51A	2.51A	2.51A
Iac RMS	0.64A	0.64A	0.64A	0.30A	0.30A	0.30A
DC Loss	1.65W	1.18W	1.83W	1.06W	0.81W	1.39W
AC Loss	0.46W	0.34W	0.52W	0.22W	0.20W	0.25W
Total Loss	2.11W	1.51W	2.35W	1.27W	1.01W	1.65W
ΔT (Top)	78.1K	49.9K	80.9K	47.1K	33.2K	56.8K
ΔT (Terminal)	58.0K	35.5K	58.6K	35.0K	23.6K	41.1K

Explanation of Part Numbers

Panasonic's ETQ-PM Series Part Number Breakdown



Selection Guide

Panasonic's ETQ-PM Series Selection Guide

Panasonic's ETQ-PM High Performance Series Selection Guide

Type	5x5 ETQ-P*MxxxYFP		6x6 ETQ-P*MxxxYFN		7x7 ETQ-P5MxxxYFM		8x8 ETQ-P*MxxxY*K		10x10 ETQ-P*MxxxY*C		10x10 (Low DCR) ETQ-P*MxxxYLC	
(Size) WxLxT Height=t	5.5x5.0mm t=3.0mm (<4.7μH) t=4.0mm (≥4.7μH)		6.5x6.0mm t=3.0mm (<6.8μH) t=4.5mm (≥6.8μH)		7.5x7.0mm t=5.4mm (<95μH) t=5.0mm (≥95μH)		8.5x8.0 ETQ-P*MxxxY*K		10.7x10.0mm t=5.4mm (<95μH) t=5.0mm (≥95μH)		10.9x10.0mm t=5.0mm (<1.5μH) t=6.0mm (≥1.5μH)	
L ₀ (μH)	Rated Current (A)	DCR (mΩ)	Rated Current (A)	DCR (mΩ)	Rated Current (A)	DCR (mΩ)	Rated Current (A)	DCR (mΩ)	Rated Current (A)	DCR (mΩ)	Rated Current (A)	DCR (mΩ)
100					1.4(*1)	348	1.7	302	1.6(*2)	208		
68									3.0(*7)	136		
47			1.8	210	2.3 (*3)	156	2.9 (*3)	125	3.5	99		
33					2.6	120			4.2	68.5		
22	1.9	163	2.3	126	3.0	92.0	4.1	63.0	5.2(*5)	45.0		
15							4.7	48.2				
10			3.5	54.2	4.7	37.6	5.7	33.4	7.1	23.8		
6.8			4.1	39.3	5.5	26.7						
4.7	4.0	36.0			6.3	20.4			10.9	10.2	11.8	8.7
3.3	4.0	32.3							13.1	7.1	14.2 (*6)	6.0
2.2	4.8	22.6					11.9 (*4)	7.6	15.1(*4)	5.3	16.3 (*4)	4.55
1.5									17.9	3.8	19.6	3.2
1.0			8.8	7.9							23.0	2.3
0.68			9.8	6.3							26.3	1.75
0.33												

Note: Current value (Rated Current) is the typical value when overall temperature rise is 40k

(*1) 95μH (*2) 97μH (*3) 48μH (*4) 2.5μH (*5) 21.5μH (*6) 3.2μH (*7) 66μH

Line-up

High Power Type / Vibration Proof Type

Standard Type (High-I Saturation)

5 x 5				6 x 6											
M0530M		M0540M		M0630M		M0645M									
ETQP3M_ YFP		ETQP4M_ YFP		ETQP3M_ YFN		ETQP4M_ YFN									
															
5.5 x 5.0 x H3.0 (mm)		5.5 x 5.0 x H4.0 (mm)		6.5 x 6.0 x H3.0 (mm)		6.5 x 6.0 x H4.5 (mm)									
Lo (μ H)	DCR (m Ω)	Rated Current (A)		Lo (μ H)	DCR (m Ω)	Rated Current (A)		Lo (μ H)	DCR (m Ω)	Rated Current (A)		Lo (μ H)	DCR (m Ω)	Rated Current (A)	
		$\triangle L:-30\%$				$\triangle L:-30\%$				$\triangle L:-30\%$				$\triangle L:-30\%$	
		$\triangle T:+40K$				$\triangle T:+40K$				$\triangle T:+40K$				$\triangle T:+40K$	
		22.0		163.0	3.1	2.3				47.0		210.0	3.8	2.2	
		4.7		36.0	7.7	4.8				33.0		172.0	4.1	2.5	
3.3	31.3	8.6		5.0						22.0		126.0	6.0	2.9	
2.2	22.6	10.9		5.8						10.0		54.2	8.3	4.5	
		4.7		15.0	48.2	7.7		1.0	7.9	20.0		8.8		6.8	
		3.3		22.0	63.0	6.9		0.68	6.3	24.0		9.8		2.2	
		2.5				4.7				3.3				10.4	
		1.5				10.2				2.2				14.4	
		1.5				20.0				13.1				10.2	
		1.5				23.4				14.7				11.2	
		1.5				22.7				15.7				7.0	
		1.5				27.2				18.1				8.5	
		1.5				35.1				21.4				13.1	

7 x 7				8 x 8				10 x 10			
M0754M		M0854M		M1054M		ETQP5M_ YFC					
ETQP5M_ YFM		ETQP5M_ YFK		ETQP5M_ YFC							
											
7.5 x 7.0 x H5.4 (mm)		8.5 x 8.0 x H5.4 (mm)		10.7 x 10.0 x H5.4 (mm)							
Lo (μ H)	DCR (m Ω)	Rated Current (A)		Lo (μ H)	DCR (m Ω)	Rated Current (A)		Lo (μ H)	DCR (m Ω)	Rated Current (A)	
		$\triangle L:-30\%$				$\triangle L:-30\%$				$\triangle L:-30\%$	
		$\triangle T:+40K$				$\triangle T:+40K$				$\triangle T:+40K$	
100.0	348.0	3.1		100.0	302.0	3.0		97.0	208.0	3.0	
68.0	251.0	3.9				2.1		68.0	136.0	5.2	
47.0	156.0	4.1		48.0	125.0	5.4		47.0	99.0	6.8	
33.0	120.0	4.8				3.4		33.0	68.5	7.6	
22.0	92.0	5.8		22.0	63.0	6.9		22.0	45.0	8.8	
		15.0		15.0	48.2	7.7		15.0	35.6	11.2	
10.0	37.6	10.6		10.0	33.4	13.0		10.0	23.8	12.0	
6.8	26.7	12.0				6.7				8.5	
4.7	20.4	13.1				4.8				13.1	
3.3	11.9	14.4		3.3	9.5	17.9		3.3	7.1	20.0	
		12.5		2.5	7.6	20.1		3.3	7.1	14.7	
		2.5				14.0				15.7	
		2.5				22.7				18.1	
		2.5				27.2				21.4	
		1.5				35.1				20.0	

•Rated current is the current value at which temperature rise is 40K. Please use within Tc 150°C including self-temperature rise.

•The proven current value for making the overall temperature rise of 40k, when mounted on multi-layer board with high-heat dissipation.

LP Type / LE Type

LP Type

5 x 5				6 x 6				8 x 8				10 x 10											
M0530M-LP		M0630M-LP		M0840M-LP		M1040M-LP																	
ETQP3M_KVP		ETQP3M_KVN		ETQP4M_KVK		ETQP4M_KVC																	
																							
5.5 x 5.0 x H3.0 (mm)				6.4 x 6.0 x H3.0 (mm)				8.5 x 8.0 x H4.0 (mm)				10.7 x 10.0 x H4.0 (mm)											
L ₀ (μ H)	DCR (m Ω)	Rated Current (A)		L ₀ (μ H)	DCR (m Ω)	Rated Current (A)		L ₀ (μ H)	DCR (m Ω)	Rated Current (A)		L ₀ (μ H)	DCR (m Ω)	Rated Current (A)									
		$\triangle L:-30\%$	$\triangle T:+40K$			$\triangle L:-30\%$	$\triangle T:+40K$			$\triangle L:-30\%$	$\triangle T:+40K$			$\triangle L:-30\%$	$\triangle T:+40K$								
				33.0	206.0	3.0	2.1	33.0	118.0	4.7	3.1	33.0	84.6	5.6	4.2								
				22.0	128.0	4.3	2.7	22.0	78.4	6.0	3.8	22.0	60.0	7.4	5.0								
				15.0	99.2	5.1	3.0	15.0	55.0	7.6	4.5	15.0	37.0	9.2	6.3								
10.0	96.0	4.2	2.4	10.0	71.0	5.8	3.6	10.0	41.6	9.1	5.2	10.0	25.4	10.8	7.6								
6.8	65.7	6.1	2.9	6.8	45.6	8.1	4.5	6.8	23.5	11.0	6.9	6.8	18.5	12.1	8.9								
4.7	45.6	6.7	3.4	4.7	29.0	9.8	5.6	4.7	16.1	15.1	8.3	4.7	12.3	13.9	11.2								
3.3	27.3	8.0	4.4	3.3	24.1	11.5	6.1	3.3	14.1	17.4	8.9	3.3	9.4	17.1	12.6								
2.2	20.0	10.1	5.2	2.2	14.5	12.8	7.9	2.2	8.5	20.4	11.4	2.2	6.8	21.0	14.8								
1.5	12.0	12.0	6.7	1.5	11.0	14.2	9.1	1.5	4.9	22.5	15.1	1.5	4.9	25.0	17.4								
1.0	9.6	14.1	7.5	1.0	6.2	16.0	12.1	1.0	3.7	24.4	17.3	1.0	2.6	34.6	23.9								
0.68	7.6	15.9	8.43	0.68	5.2	20.2	13.2	0.68	2.92	29.0	19.5												
0.33	4.85	21.8	10.5																				

LE Type

6 x 6				7 x 7											
M0648M-LE		M0748M-LE													
ETQP4M_KFN		ETQP4M_KFM													
															
6.5 x 6.0 x H4.8 (mm)				7.5 x 7.0 x H4.8 (mm)											
L ₀ (μ H)	DCR (m Ω)	Rated Current (A)		L ₀ (μ H)	DCR (m Ω)	Rated Current (A)		L ₀ (μ H)	DCR (m Ω)	Rated Current (A)		L ₀ (μ H)	DCR (m Ω)	Rated Current (A)	
		$\triangle L:-30\%$	$\triangle T:+40K$			$\triangle L:-30\%$	$\triangle T:+40K$			$\triangle L:-30\%$	$\triangle T:+40K$			$\triangle L:-30\%$	$\triangle T:+40K$
				47.0	148.6	3.7	2.9								
				22.0	84.1	4.6	3.9								
15.0	63.8	6.7	4.2												
10.0	40.4	8.1	5.2	10.0	36.0	9.6	6.0								
4.7	20.7	9.3	7.3	4.7	16.8	10.7	8.8								
3.3	13.1	12.0	9.2												

•Rated current is the current value at which temperature rise is 40K. Please use within Tc 150°C including self-temperature rise.

•The proven current value for making the overall temperature rise of 40k, when mounted on multi-layer board with high-heat dissipation.

High Power Type / Vibration Proof Type

High Power Type

10 x 10 (Low-DCR) ^{*1}				12 x 12 ^{*2}							
M1050ML		M1060ML		M1280MF		ETQP8M_JFA					
ETQP5M_YLC		ETQP6M_YLC									
											
10.9 x 10.0 x H5.0 (mm)		10.9 x 10.0 x H6.0 (mm)		12.6 x 13.1/13.2 x H8.0 (mm)							
L ₀ (μ H)	DCR (m Ω)	Rated Current (A)		L ₀ (μ H)	DCR (m Ω)	Rated Current (A)		L ₀ (μ H)	DCR (m Ω)	Rated Current (A)	
		$\triangle L:-30\%$	$\triangle T:+40K$			$\triangle L:-30\%$	$\triangle T:+40K$			$\triangle L:-30\%$	$\triangle T:+40K$ (4layer)
				4.7	8.70	22.5	14.1	4.7	4.90	24.7	20.2
				3.3	6.00	26.3	17.0	3.3	3.60	27.6	23.6
				2.5	4.55	25.8	19.6	2.5	2.60	32.1	27.7
				1.5	3.20	32.0	23.3	1.5	1.80	29.9	33.3
1.0	2.30	37.8	27.5					1.0	1.36	44.4	38.3
0.68	1.75	40.0	31.5					0.68	1.10	56.9	42.6
0.33	1.10	56.7	39.7					0.33	0.70	84.5	53.5

Vibration Proof Type^{*1}

8 x 8		10 x 10 (Low-DCR)									
M0854MS		M1050MS/M1060MS									
ETQP5M_YSK		ETQP5M_YSC/ETQP6M_YSC									
											
8.5 x 8.0 x H5.4 (mm)		10.9 x 10.0 x H5.0/H6.0 (mm)									
L ₀ (μ H)	DCR (m Ω)	Rated Current (A)		L ₀ (μ H)	DCR (m Ω)	Rated Current (A)					
		$\triangle L:-30\%$	$\triangle T:+40K$			$\triangle L:-30\%$	$\triangle T:+40K$				
2.45	7.4	19.3	14.1			1.9	4.45	30.0	16.5		
				0.68	1.66	40.0	32.3				

*1: Rated current is the current value at which temperature rise is 40K. Please use within Tc 150°C including self-temperature rise.

*2: Rated current is the current value at which temperature rise is 40K. Please use within Tc 160°C including self-temperature rise.

*The proven current value for making the overall temperature rise of 40K, when mounted on multi-layer board with high-heat dissipation.

Design Support Tool

Simulation Data Vibraries

Equivalent circuit modeles, and S-parameter data can be downloaded for each individual item number.

Simulation Data Libraries

Industrial And Automotive Use LC Filter Simulator

The Industrial & Automotive use LC filter simulator enables the simulation of attenuation amounts when configuring a filter using Panasonic's power inductor and aluminum electrolytic capacitor suitable for industrial & automotive use.

LC Filter Simulator

Power Inductor Loss Simulator

The Power Inductor loss simulator for automotive application enables the simulation of losses and temperature rises according to the current for Panasonic' s power inductors designed for automotive use.suitable for industrial and automotive use.

Loss Simulator

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To access the Inductor selector tool:
na.industrial.panasonic.com/file-download/246737

To learn more about the
ETQ-PM Series visit the link below:

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