

FEATURES 特征

- Terminal structure, high mechanical reliability.
端子结构, 高机械可靠性
- Low profile design makes it optimal for surface mounting.
低高度设计, 适合表面贴装
- Excellent impedance characteristics, making it great for suppressing common mode noise.
优秀的阻抗特性, 适合抑制共模噪声
- Operating Temp : -40°C~+125°C(Including self heating)
工作温度范围:-40°C~+125°C(包括自身温度上升)



APPLICATIONS 用途

- Measures against common mode noise in power lines for various DC powerlines, multimedia devices, and various electronic devices.
应用于各种直流电源线、多媒体设备和各种电子设备的电源线共模噪声防护措施

PART NUMBERING 产品型号

PACM	9070	-	701	-	F	D5
①	②		③		④	⑤

① Series Name

PACM	Common Mode Chokes
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③ Nominal Impedance

Code (example)	Nominal Impedance [Ω]
900	90
701	700
102	1000

⑤ Special material code

D5

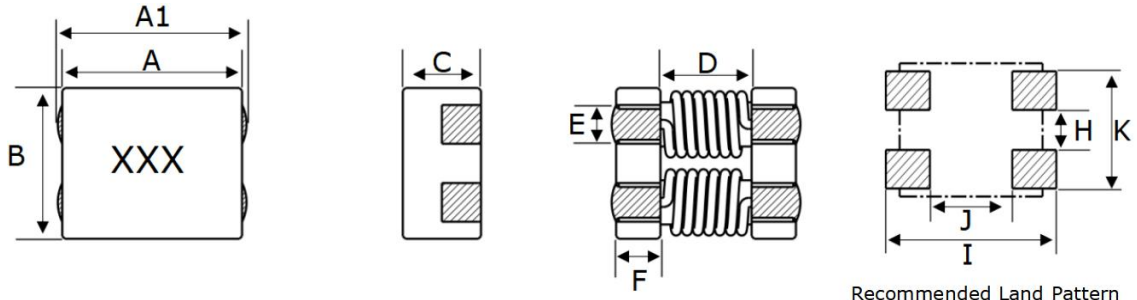
② External Dimensions

4520	4.7x4.5x2.0
7060	7.0x6.0x3.8
8080	8.0x8.0x5.0
9070	9.0x7.0x4.8
1211	12.5x10.8x6.4
1513	15.0x13.0x6.0

④ Material Code

F	F Type
CL	CL Type
FC	FC Type
M	M Type
AM	AM Type

DIMENSIONS & RECOMMENDED LAND PATTERN 尺寸及推荐焊盘

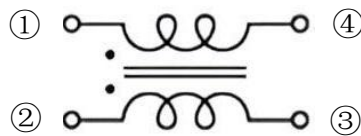


Recommended Land Pattern

Unit: mm

Series	Dimensions							Recommended Land Pattern			
	A	A1	B	C	D	E	F	K	H	I	J
	±0.5	-	±0.5	Max.	Typ.			Typ.			
PACM4520-F	4.7	-	4.5	2.2	2.7	0.8	1.0	3.0	1.0	6.0	2.0
PACM4520-M	4.7	-	4.5	2.0	2.7	0.8	1.0	3.0	1.0	6.0	2.0
PACM7060-F	7.0	7.5	6.0	3.8	3.5	1.5	1.7	5.0	1.5	8.0	3.0
PACM7060-M	7.0	7.5	6.0	3.8	3.5	1.5	1.7	5.0	1.5	8.0	3.0
PACM7060-FC	7.0	7.5	6.0	4.4	3.5	1.5	1.7	5.0	1.5	8.0	3.0
PACM8080-CL	8.0	8.5	8.0	5.3	5.2	1.5	1.5	7.0	2.5	9.0	4.0
PACM9070-F	9.0	9.5	7.0	4.8	5.6	1.5	1.7	5.5	1.5	10.5	5.0
PACM9070-M	9.0	9.5	7.0	4.8	5.6	1.5	1.7	5.5	1.5	10.5	5.0
PACM9070-AM	9.0	9.5	7.0	6.7	5.7	1.5	2.0	5.5	1.5	10.5	5.0
PACM1211-F	12.0	12.5	10.8	6.4	7.0	2.7	2.5	8.5	2.0	12.5	6.5
PACM1211-M	12.0	12.5	10.8	6.4	7.0	2.7	2.5	8.5	2.0	12.5	6.5
PACM1211-AM	12.0	12.5	10.8	8.5	7.0	2.7	2.5	8.5	2.0	12.5	6.5
PACM1513-F	15.0	15.3	13.0	6.0	9.0	2.7	3.0	9.5	3.3	16.0	8.0
PACM1513-M	15.0	15.3	13.0	6.0	9.0	2.7	3.0	9.5	3.3	16.0	8.0

EQUIVALENT CIRCUIT 等效电路



ELECTRICAL CHARACTERISTICS 特性规格表

● PACM4520-FD Series

Part Number	Impedance @100MHz		DC Resistance	Rated Current	Rated Voltage	Insulation Resistance	Marking
	Min.	Typ.	Max.	Max.	Max.	Min.	-
Units	Ω	Ω	m Ω	A	Volts	M Ω	
Symbol	Z	Z	DCR	I _{rms}	VDC	IR	
PACM4520-900-FD5	60	90	35	3.30	50	10	900
PACM4520-151-FD5	90	150	40	3.20	50	10	151
PACM4520-231-FD5	180	230	45	3.10	50	10	231
PACM4520-301-FD5	200	300	45	3.10	50	10	301
PACM4520-421-FD5	300	420	50	2.60	50	10	421
PACM4520-701-FD5	500	700	59	2.30	50	10	701
PACM4520-901-FD5	650	900	68	2.20	50	10	901
PACM4520-102-FD5	800	1000	68	2.20	50	10	102
PACM4520-122-FD5	1000	1200	74	2.10	50	10	122
PACM4520-142-FD5	1200	1400	81	1.95	50	10	142

● PACM4520-MD Series

Part Number	Impedance @100MHz		DC Resistance	Rated Current	Rated Voltage	Insulation Resistance	Marking
	Min.	Typ.	Max.	Max.	Max.	Min.	-
Units	Ω	Ω	m Ω	A	Volts	M Ω	
Symbol	Z	Z	DCR	I _{rms}	VDC	IR	
PACM4520-900-MD5	60	90	35	3.30	50	10	900
PACM4520-151-MD5	90	150	40	3.20	50	10	151
PACM4520-231-MD5	180	230	45	3.10	50	10	231
PACM4520-301-MD5	200	300	45	3.10	50	10	301
PACM4520-421-MD5	300	420	50	2.60	50	10	421
PACM4520-701-MD5	500	700	59	2.30	50	10	701
PACM4520-901-MD5	650	900	68	2.20	50	10	901
PACM4520-102-MD5	800	1000	68	2.20	50	10	102
PACM4520-122-MD5	1000	1200	74	2.10	50	10	122
PACM4520-142-MD5	1200	1400	81	1.95	50	10	142

● PACM7060-FD Series

Part Number	Impedance @100MHz		DC Resistance	Rated Current	Rated Voltage	Insulation Resistance	Marking
	Min.	Typ.	Max.	Max.	Max.	Min.	-
Units	Ω	Ω	m Ω	A	Volts	M Ω	
Symbol	Z	Z	DCR	I _{rms}	VDC	IR	
PACM7060-400-FD5	40	70	5	15.3	125	10	400
PACM7060-101-FD5	100	140	10	9.30	125	10	101
PACM7060-301-FD5	225	300	10	5.20	125	10	301
PACM7060-501-FD5	275	450	10	5.20	125	10	501
PACM7060-601-FD5	500	700	15	4.20	125	10	601

ELECTRICAL CHARACTERISTICS 特性规格表

● PACM7060-FD Series

Part Number	Impedance @100MHz		DC Resistance	Rated Current	Rated Voltage	Insulation Resistance	Marking
	Min.	Typ.	Max.	Max.	Max.	Min.	-
Units	Ω	Ω	m Ω	A	Volts	M Ω	
Symbol	Z	Z	DCR	I _{rms}	VDC	IR	
PACM7060-701-FD5	500	700	15	4.20	125	10	701
PACM7060-102-FD5	800	1020	17	3.10	125	10	102
PACM7060-132-FD5	910	1300	21	2.60	125	10	132
PACM7060-272-FD5	2000	2700	63	1.05	125	10	272
PACM7060-302-FD5	2500	3000	75	0.95	125	10	302

● PACM7060-MD Series

Part Number	Impedance @100MHz		DC Resistance	Rated Current	Rated Voltage	Insulation Resistance	Marking
	Min.	Typ.	Max.	Max.	Max.	Min.	-
Units	Ω	Ω	m Ω	A	Volts	M Ω	
Symbol	Z	Z	DCR	I _{rms}	VDC	IR	
PACM7060-400-MD5	40	70	5	15.3	125	10	400
PACM7060-101-MD5	100	140	10	9.30	125	10	101
PACM7060-301-MD5	225	300	10	5.20	125	10	301
PACM7060-501-MD5	275	450	10	5.20	125	10	501
PACM7060-601-MD5	500	700	15	4.20	125	10	601
PACM7060-701-MD5	500	700	15	4.20	125	10	701
PACM7060-102-MD5	800	1020	17	3.10	125	10	102
PACM7060-132-MD5	910	1300	21	2.60	125	10	132
PACM7060-272-MD5	2000	2700	63	1.05	125	10	272
PACM7060-302-MD5	2500	3000	75	0.95	125	10	302

● PACM7060-FCD Series

Part Number	Impedance @100MHz		DC Resistance	Rated Current	Rated Voltage	Insulation Resistance	Marking
	Min.	Typ.	Max.	Max.	Max.	Min.	-
Units	Ω	Ω	m Ω	A	Volts	M Ω	
Symbol	Z	Z	DCR	I _{rms}	VDC	IR	
PACM7060-701-FCD5	500	700	15	4.20	50	10	701
PACM7060-102-FCD5	800	1500	17	3.10	50	10	102

ELECTRICAL CHARACTERISTICS 特性规格表

● PACM8080-CLD Series

Part Number	Impedance @100MHz		DC Resistance	Rated Current	Rated Voltage	Insulation Resistance	Marking
	Min.	Typ.	Max.	Max.	Max.	Min.	-
Units	Ω	Ω	m Ω	A	Volts	M Ω	
Symbol	Z	Z	DCR	Irms	VDC	IR	
PACM8080-301-CLD5	200	300	6	7.20	80	10	301
PACM8080-501-CLD5	400	600	8	6.20	80	10	501
PACM8080-701-CLD5	500	700	10	5.70	80	10	701
PACM8080-102-CLD5	750	1000	15	4.70	80	10	102
PACM8080-152-CLD5	1200	1500	20	3.60	80	10	152
PACM8080-222-CLD5	1700	2200	40	3.30	80	10	222
PACM8080-272-CLD5	2000	2700	60	2.60	80	10	272
PACM8080-302-CLD5	2500	3000	80	2.30	80	10	302

● PACM9070-FD Series

Part Number	Impedance @100MHz		DC Resistance	Rated Current	Rated Voltage	Insulation Resistance	Marking
	Min.	Typ.	Max.	Max.	Max.	Min.	-
Units	Ω	Ω	m Ω	A	Volts	M Ω	
Symbol	Z	Z	DCR	Irms	VDC	IR	
PACM9070-301-FD5	225	300	6	6.20	80	10	301
PACM9070-501-FD5	450	600	8	5.70	80	10	501
PACM9070-701-FD5	500	700	10	5.20	80	10	701
PACM9070-102-FD5	750	1000	13	4.20	80	10	102
PACM9070-222-FD5	1700	2200	50	3.10	80	10	222
PACM9070-272-FD5	2000	2700	80	2.10	80	10	272
PACM9070-302-FD5	2500	3000	80	2.10	80	10	302

● PACM9070-MD Series

Part Number	Impedance @100MHz		DC Resistance	Rated Current	Rated Voltage	Insulation Resistance	Marking
	Min.	Typ.	Max.	Max.	Max.	Min.	-
Units	Ω	Ω	m Ω	A	Volts	M Ω	
Symbol	Z	Z	DCR	Irms	VDC	IR	
PACM9070-301-MD5	225	300	6	6.20	80	10	301
PACM9070-501-MD5	450	600	8	5.70	80	10	501
PACM9070-701-MD5	500	700	10	5.20	80	10	701
PACM9070-102-MD5	750	1000	13	4.20	80	10	102
PACM9070-222-MD5	1700	2200	50	3.10	80	10	222
PACM9070-272-MD5	2000	2700	80	2.10	80	10	272
PACM9070-302-MD5	2500	3000	80	2.10	80	10	302

ELECTRICAL CHARACTERISTICS 特性规格表

● PACM9070-AMD Series

Part Number	Impedance @100MHz		DC Resistance	Rated Current	Rated Voltage	Insulation Resistance	Marking
	Min.	Typ.	Max.	Max.	Max.	Min.	-
Units	Ω	Ω	m Ω	A	Volts	M Ω	
Symbol	Z	Z	DCR	I _{rms}	VDC	IR	
PACM9070-152-AMD5	600	1500	50	3.10	50	10	152
PACM9070-322-AMD5	2200	3200	125	2.10	50	10	322

● PACM1211-FD Series

Part Number	Impedance @100MHz		DC Resistance	Rated Current	Rated Voltage	Insulation Resistance	Marking
	Min.	Typ.	Max.	Max.	Max.	Min.	-
Units	Ω	Ω	m Ω	A	Volts	M Ω	
Symbol	Z	Z	DCR	I _{rms}	VDC	IR	
PACM1211-800-FD5	80	230	2	10.3	125	10	800
PACM1211-301-FD5	200	300	4	9.30	125	10	301
PACM1211-501-FD5	300	500	6	8.30	125	10	501
PACM1211-701-FD5	500	700	6	8.30	125	10	701
PACM1211-801-FD5	600	800	8	8.30	125	10	801
PACM1211-102-FD5	750	1000	14	6.20	125	10	102
PACM1211-222-FD5	2200	2500	35	1.85	125	10	222
PACM1211-272-FD5	2300	2700	50	1.55	125	10	272

● PACM1211-MD Series

Part Number	Impedance @100MHz		DC Resistance	Rated Current	Rated Voltage	Insulation Resistance	Marking
	Min.	Typ.	Max.	Max.	Max.	Min.	-
Units	Ω	Ω	m Ω	A	Volts	M Ω	
Symbol	Z	Z	DCR	I _{rms}	VDC	IR	
PACM1211-800-MD5	80	230	2	10.3	125	10	800
PACM1211-301-MD5	200	300	4	9.30	125	10	301
PACM1211-501-MD5	300	500	6	8.30	125	10	501
PACM1211-701-MD5	500	700	6	8.30	125	10	701
PACM1211-801-MD5	600	800	8	8.30	125	10	801
PACM1211-102-MD5	750	1000	14	6.20	125	10	102
PACM1211-222-MD5	2200	2500	35	1.85	125	10	222
PACM1211-272-MD5	2300	2700	50	1.55	125	10	272

ELECTRICAL CHARACTERISTICS 特性规格表

● PACM1211-AMD Series

Part Number	Impedance @100MHz		DC Resistance	Rated Current	Rated Voltage	Insulation Resistance	Marking
	Min.	Typ.	Max.	Max.	Max.	Min.	-
Units	Ω	Ω	m Ω	A	Volts	M Ω	
Symbol	Z	Z	DCR	Irms	VDC	IR	
PACM1211-172-AMD5	1100	1700	26	5.70	125	10	172
PACM1211-202-AMD5	1300	2000	33	4.70	125	10	202
PACM1211-222-AMD5	1400	2200	43	4.20	125	10	222
PACM1211-532-AMD5	3700	5300	109	2.60	125	10	532
PACM1211-782-AMD5	5400	7800	182	2.10	125	10	782

● PACM1513-FD Series

Part Number	Impedance @100MHz		DC Resistance	Rated Current	Rated Voltage	Insulation Resistance	Marking
	Min.	Typ.	Max.	Max.	Max.	Min.	-
Units	Ω	Ω	m Ω	A	Volts	M Ω	
Symbol	Z	Z	DCR	Irms	VDC	IR	
PACM1513-301-FD5	250	300	5	13.3	80	10	301
PACM1513-551-FD5	450	550	6	10.3	80	10	551
PACM1513-601-FD5	500	600	7	10.3	80	10	601
PACM1513-701-FD5	500	700	7	10.3	80	10	701
PACM1513-102-FD5	800	1000	12	10.3	80	10	102

● PACM1513-MD Series

Part Number	Impedance @100MHz		DC Resistance	Rated Current	Rated Voltage	Insulation Resistance	Marking
	Min.	Typ.	Max.	Max.	Max.	Min.	-
Units	Ω	Ω	m Ω	A	Volts	M Ω	
Symbol	Z	Z	DCR	Irms	VDC	IR	
PACM1513-301-MD5	250	300	5	13.3	80	10	301
PACM1513-551-MD5	450	550	6	10.3	80	10	551
PACM1513-601-MD5	500	600	7	10.3	80	10	601
PACM1513-701-MD5	500	700	7	10.3	80	10	701
PACM1513-102-MD5	800	1000	12	10.3	80	10	102

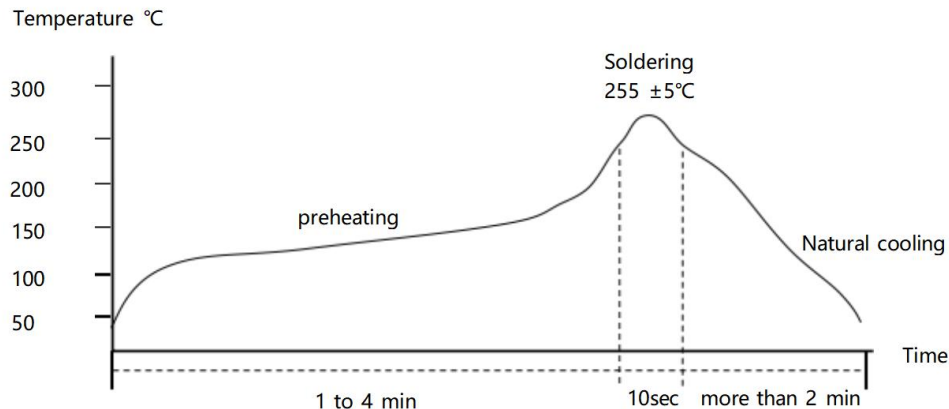
- Rated Current: Temp.rise 40°C Typ.
- Storage Temperature: 15°C up to 25°C, 65% RH Max.
- The temperature of electrical characteristic test is 25°C indoor temperature.

RELIABILITY TEST 可靠性试验

Operating Temperature	- 40 to +125 °C (Contain Heating coil)
Appearance Inspection	No external defects by visual inspection
Terminal Strength	After soldering , between copper plaet and terminalsof coils , push in two directions of X , Y with standing 10N(1.02kgf) for10+/-2 sec. Terminal should not peel off. (Refer to figure at right)
Heat endurance of reflow soldering	Refer to figure
Insulating resistance	Over 10 MΩ at 80V D.C . between wire and core
Dielectric Strength	Apply at 0.5KV 1mA for 3S between wire and core
Temperature characteristics	Inductance coefficient (0~2,000) × 10 / °C (- 40~ + 125 °C)
Humidity characteristics	Inductance deviation within ± 10% , after 96 hours in 90~95% relative humidity at 40 ± 2 °C and 1 hours drying under normal condition
A test is made under the above mentioned condition , and it is kept for 2 hours in the normal	

RECOMMENDED SOLDERING TECHNOLOGIES 回流焊建议

Re-flow profile



Temperature and humidity . After that , no mechanical and electrical defect should be found.

■ PRECAUTIONS ON USE 使用注意事项

● Precautions on Use.

- 1.Always wear static control bands to protect against ESD.
- 2.Any devices used with the products (soldering irons, measuring instruments) should be properly grounded.
- 3.Keep bare hands and metal conductors (i.e., metal desk) away from electrodes or conductive areas that lead to electrodes.
- 4.Preheat when soldering.
- 5.Don't apply current in excess of the rated current value. It may reduce the impedance or inductance, or cause damage to components due to over-current.
- 6.For magnetic products, keep clear of anything that may generate magnetic fields such as speakers and coils. Use non-magnetic tweezers when handling the chips.
- 7.When soldering, the electrical characteristics may be varied due to hot energy and mechanical stress.
- 8.When coating products with resin, the relatively high resin curing stress may change the electrical characteristics. For exterior coating, select resin carefully so that electrical and mechanical performance of the product is not affected. Before using, please evaluate reliability with the product mounted in your application set.
- 9.When mount chips with adhesive in preliminary assembly, do appropriate check before the soldering stage, i.e., the size of land pattern, type of adhesive, amount applied, hardening of the adhesive on proper usage and amounts of adhesive to use.
- 10.Mounting density: Add special attention to radiating heat of products when mounting other components nearby. The excessive heat by other products may cause deterioration at joint of this product with substrate.
- 11.Since some products are constructed like an open magnetic circuit, narrow spacing between components may cause magnetic coupling.
- 12.Please do not give the product any excessive mechanical shocks in transportation.
- 13.Please do not touch wires by sharp terminals such as tweezers to avoid causing any damage to wires.
- 14.Please do not add any shock and power to the soldered product to avoid causing any damage to chip body.
- 15.Please do not touch the electrodes by naked hand as the solderability of the external electrodes may deteriorate by grease or oil on the skin.
- 16.Magnetic materials shall be far away from parts to avoid impacts on their electrical characteristics;
- 17.Parts could be damaged by external mechanical pressure or stacked heavy objects, as well as strong shaking & dropping;
- 18.Please do not store parts in bulk to prevent coils and parts being damaged;
- 19.Oversized external force to parts on PCB may lead to parts being damaged or slipped off;
- 20.Please do not use parts on edge or top of PCB board in your design to avoid parts being damaged during PCB is moved.
- 21.Please use flux contained with resin since the highly acidic (Chlorine content more than 0.2 wt%) or water-soluble one could damage the insulation film of wires, then causing short circuit of parts.
- 22.Please do not use the brush to clean product or its surroundings. If you use the brush to clean product or its surroundings on PCB, copper wire may be broke, causing the product open.
- 23.Avoid ultrasonic processing, which may cause component falling off and poor pad contact.
- 24.When using APV products, customers should record the production batch number for traceability.

■ SAFETY REMINDERS 注意事项

SAFETY REMINDERS

● All products listed in this specification are developed, designed and intended for use in general electronics equipment. The products are not designed or Warranted to meet the requirements of the applications listed below, whose performance and/or quality require especially high reliability, or whose failure, malfunction or trouble might directly cause damage to society, person, or property. Please understand that we are not responsible for any damage or liability caused by use of the products in any of the applications below. Please contact us for more details if you intend to use our products in the following applications.

- ☆ 1.Aerospace/aviation equipment
- ☆ 2.Transportation equipment (cars, electric trains, ships, etc.)
- ☆ 3.Medical equipment
- ☆ 4.Power-generation control equipment
- ☆ 5.Atomic energy-related equipment
- ☆ 6.Seabed equipment
- ☆ 7.Transportation control equipment
- ☆ 8.Public information-processing equipment
- ☆ 9.Military equipment
- ☆ 10.Electric heating apparatus, burning equipment
- ☆ 11.Disaster prevention/crime prevention equipment
- ☆ 12.Safety equipment
- ☆ 13.Other applications that are not considered general-purpose applications

● When designing your equipment even for general-purpose applications, you are kindly requested to take into consideration securing protection circuit/device or providing backup circuits in your equipment.