

FM Series for Automatic Assembly

The FM series includes small, resin-molded electric double-layer capacitors suitable for automatic assembly. These capacitors are ideal as long-time backup devices for minute-current loads in VCRs, audio systems, cordless telephones, and compact electronic systems. (FME types are backup devices adaptable to current consumption mA level.)

Features

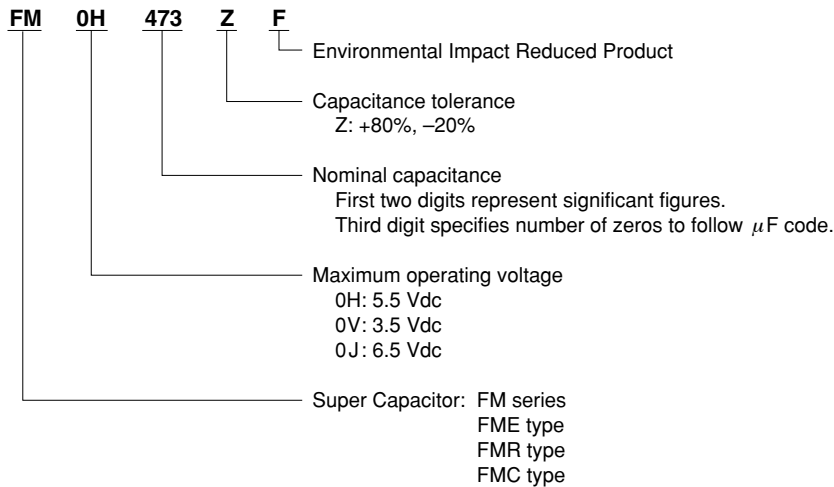
- High adaptability to automatic assembly
- Can be cleaned
- Excellent voltage holding characteristics ideal for long-time supply of 1 μ A to several hundred μ A (Except 3.5 V type, FME type)
- Space saving

Applications

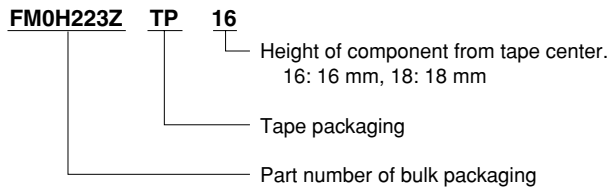
Backup of CMOS microcomputers, static RAMs, and DTSs

Part Number System

- Bulk



- Tape (Ammo Pack)



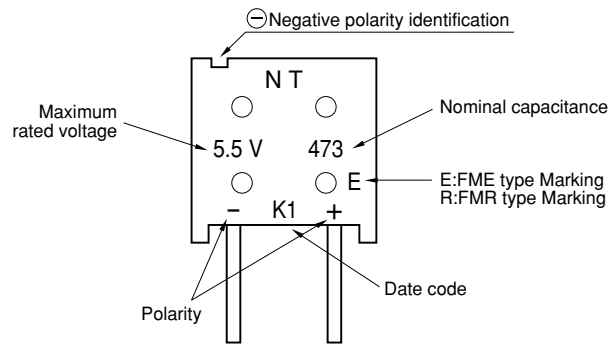
Number of Packed Capacitors

Tape: 1000 pcs./box

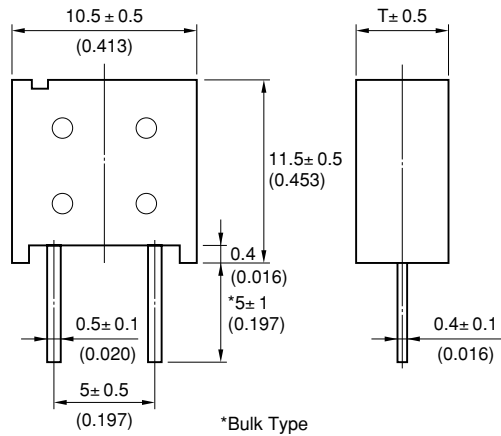


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Markings



Dimensions



Unit: mm
(inch)

Standard Rating

● 5.5 V Type

Part Number	Ammo pack	Max. Operating Voltage (VDC)	Nominal Capacitance		Max. ESR (at 1 kHz) (Ω)	Max. Current at 30 minutes (mA)	Voltage Holding Characteristic Min. (V)	T mm (inch)	Weight g (oz)
			Charge System (F)	Discharge System (F)					
FM0H103ZF	FM0H103ZFTP ()	5.5	0.01	0.014	300	0.015	4.2	5.0 (0.197)	1.3 (0.046)
FM0H223ZF	FM0H223ZFTP ()	5.5	0.022	0.028	200	0.033	4.2	5.0 (0.197)	1.3 (0.046)
FM0H473ZF	FM0H473ZFTP ()	5.5	0.047	0.06	200	0.071	4.2	5.0 (0.197)	1.3 (0.046)
FM0H104ZF	FM0H104ZFTP ()	5.5	0.10	0.13	100	0.15	4.2	6.5 (0.256)	1.6 (0.056)
FM0H224ZF	FM0H224ZFTP ()	5.5	—	0.22	100	0.33	4.2	6.5 (0.256)	1.6 (0.056)

Note: To complete part number, insert lead length H. (16 or 18 mm: Refer to Taping Specification on page 26.)



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● 3.5 V Type

Part Number	Ammo pack	Max. Operating Voltage (VDC)	Nominal Capacitance		Max. ESR (at 1 kHz) (Ω)	Max. Current at 30 minutes (mA)	T mm (inch)	Weight g (oz)
			Charge System (F)	Discharge System (F)				
FM0V473ZF	FM0V473ZFTP ()	3.5	0.047	0.06	200	0.042	5.0 (0.197)	1.3 (0.046)
FM0V104ZF	FM0V104ZFTP ()	3.5	0.10	0.13	100	0.090	5.0 (0.197)	1.3 (0.046)
FM0V224ZF	FM0V224ZFTP ()	3.5	0.22	0.30	100	0.20	6.5 (0.256)	1.6 (0.056)

Note: To complete part number, insert lead length H. (16 or 18 mm: Refer to Taping Specification on page 26.)

● FME Type (Backup Large Current , mA Order)

Part Number	Ammo pack	Max. Operating Voltage (VDC)	Nominal Capacitance		Max. ESR (at 1 kHz) (Ω)	Max. Current at 30 minutes (mA)	T mm (inch)	Weight g (oz)
			Charge System (F)	Discharge System (F)				
FME0H223ZF	FME0H223ZFTP ()	5.5	0.022	0.028	40	0.033	5.0 (0.197)	1.3 (0.046)
FME0H473ZF	FME0H473ZFTP ()	5.5	0.047	0.06	20	0.071	5.0 (0.197)	1.3 (0.046)

Note: To complete part number, insert lead length H. (16 or 18 mm: Refer to Taping Specification on page 26.)

● FMR Type (Max. Operating Temperature 85°C type)

Part Number	Ammo pack	Max. Operating Voltage (VDC)	Nominal Capacitance		Max. ESR (at 1 kHz) (Ω)	Max. Current at 30 minutes (mA)	Voltage Holding Characteristic Min.(V)	T mm (inch)	Weight g (oz)
			Charge System (F)	Discharge System (F)					
FMR0H473ZF	FMR0H473ZFTP ()	5.5	0.047	0.062	200	0.071	4.2	6.5	1.6

Note: To complete part number, insert lead length H. (16 or 18 mm: Refer to Taping Specification on page 26.)

● 6.5V Type

Part Number	Ammo pack	Max. Operating Voltage (VDC)	Nominal Capacitance		Max. ESR (at 1 kHz) (Ω)	Max. Current at 30 minutes (mA)	T mm (inch)	Weight g (oz)
			Charge System (F)	Discharge System (F)				
FM0J473ZF	FM0J473ZFTP ()	6.5	0.047	0.062	200	0.085	6.5	1.6

Note: To complete part number, insert lead length H. (16 or 18 mm: Refer to Taping Specification on page 26.)



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Specifications: FM Series 5.5V Type

Item		Specifications		Test Conditions Conforming to JIS C 5102-1994
Operating Temperature Range		-25°C to +70°C		
Maximum Operating Voltage		5.5 VDC		
Nominal Capacitance Range		Refer to standard ratings		
Capacitance Allowance		+80%, -20%		Refer to characteristics measuring method.
Equivalent Series Resistance		Refer to standard ratings		Refer to characteristics measuring method.
Current (30-minutes value)		Refer to standard ratings		Refer to characteristics measuring method.
Surge Voltage		Capacitance	More than 90% of initial requirement	Conforms to 7.14 Surge Voltage: 6.3 V Temperature: 70 ± 2°C Charge: 30 sec. Discharge: 9 min. 30 sec. Number of cycles 1000 cycles. Series resistance: 0.01F: 1500 Ω 0.22F: 56 Ω 0.022 F: 560 Ω 0.047 F: 300 Ω 0.10 F: 150 Ω Discharge resistance: 0 Ω
		Equivalent series resistance	Not to exceed 120% of initial requirement	
		Current (30-minute value)	Not to exceed 120% of initial requirement	
		Appearance	No obvious abnormality.	
Temperature Variation of Characteristics	Phase 2	Capacitance	50% or higher of initial value	Conforms to 7.12 Phase 1: +25 ± 2°C Phase 2: -25 ± 2°C Phase 4: +25 ± 2°C Phase 5: +70 ± 2°C Phase 6: +25 ± 2°C
		Equivalent series resistance	4 or less times initial value	
	Phase 5	Capacitance	200% or below of initial value	
		Equivalent series resistance	Satisfy initial standard value	
	Phase 6	Current (30-minute value)	1.5 CV (mA) or below	
		Capacitance	Within ±20% of initial value	
		Equivalent series resistance	Satisfy initial standard value	
		Current (30-minute value)	Satisfy initial standard value	
Lead Strength (Tensile)		No loosening nor permanent damage of the leads		Conforms to 8.1.2 (1) 1 kg 10sec.
Vibration Resistance		Capacitance	Satisfy initial standard value	Conforms to 8.2.3 Frequency : 10 to 55 Hz Test duration : 6 hours
		Equivalent series resistance		
		Current (30-minute value)		
		Appearance	No obvious abnormality	
Solderability		3/4 or more of the pin surface should be covered with new solder		Conforms to 8.4 Solder temperature: 245 ± 5°C Dipping duration: 5 ± 0.5 sec. Dipped up to 1.6 mm from the lower end of the capacitor.
Soldering Heat Resistance		Capacitance	Satisfy initial standard value	Conforms to 8.5 Solder temperature: 260 ± 10°C Dipping duration: 10 ± 1 sec. Dipped up to 1.6 mm from the lower end of the capacitor.
		Equivalent series resistance		
		Current (30-minute value)		
		Appearance		
Temperature Cycle		Capacitance	Satisfy initial standard value	Conforms to 9.3 Temperature condition: -25°C → normal temperature → +70°C → normal temperature Number of cycles: 5 cycles
		Equivalent series resistance		
		Current (30-minute value)		
		Appearance		
Humidity Resistance		Capacitance	Within 20% of initial value	Conforms to 9.5 Temperature: 40 ± 2°C Relative humidity: 90 to 95% RH Test duration: 240 ± 8 hours
		Equivalent series resistance	1.2 or less times initial standard value	
		Current (30-minute value)	1.2 or less times initial standard value	
		Appearance	No obvious abnormality	
High Temperature Load		Capacitance	Within 30% of initial value	Conforms to 9.10 Temperature: 70 ± 2°C Voltage applied: 5.5 Vdc Series protection resistance: 0 Ω Test duration: 1000 ⁺⁸ hours
		Equivalent series resistance	Twice or less times initial standard value	
		Current (30-minute value)	Twice or less times initial standard value	
		Appearance	No obvious abnormality	
Voltage Holding Characteristics (Self Discharge)		Voltage between terminal leads higher than 4.2 V		Charging condition Voltage applied: 5.0 VDC Series resistance: 0 Ω Charging time: 24hours
				Storage Time: 24hours Temperature: Lower than 25°C Humidity: Lower than 70%RH



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Specifications: FM Series 3.5V Type

Item		Specifications		Test Conditions Conforming to JIS C 5102 ⁻¹⁹⁹⁴
Operating Temperature Range		-25°C to +70°C		
Maximum Operating Voltage		3.5 VDC		
Nominal Capacitance Range		Refer to standard ratings		
Capacitance Allowance		+80%, -20%		Refer to characteristics measuring method.
Equivalent Series Resistance		Refer to standard ratings		Refer to characteristics measuring method.
Current (30-minutes value)		Refer to standard ratings		Refer to characteristics measuring method.
Surge Voltage		Capacitance	More than 90% of initial requirement	Conforms to 7.14 Surge voltage: 4.0 V Temperature: 70 ± 2°C Charge: 30 sec. Discharge: 9 min. 30 sec. Number of cycles 1000 cycles. Series resistance: 0.047 F: 300 Ω 0.10 F: 150 Ω 0.22 F: 56 Ω Discharge resistance: 0 Ω
		Equivalent series resistance	Not to exceed 120% of initial requirement	
		Current (30-minute value)	Not to exceed 120% of initial requirement	
		Appearance	No obvious abnormality	
Temperature Variation of Characteristics	Phase 2	Capacitance	50% or higher of initial value	Conforms to 7.12 Phase 1: +25 ± 2°C Phase 2: -25 ± 2°C Phase 4: +25 ± 2°C Phase 5: +70 ± 2°C Phase 6: +25 ± 2°C
		Equivalent series resistance	4 or less times initial value	
	Phase 5	Capacitance	200% or below of initial value	
		Equivalent series resistance	Satisfy initial standard value	
	Phase 6	Current (30-minute value)	1.5 CV (mA) or below	
		Capacitance	Within ±20% of initial value	
		Equivalent series resistance	Satisfy initial standard value	
		Current (30-minute value)	Satisfy initial standard value	
Lead Strength (Tensile)		No loosening nor permanent damage of the leads		Conforms to 8.1.2 (1) 1 kg 10 sec
Vibration Resistance		Capacitance	Satisfy initial standard value	Conforms to 8.2.3 Frequency: 10 to 55 Hz Test duration: 6 hours
		Equivalent series resistance		
		Current (30-minute value)		
		Appearance		
Solderability		3/4 or more of the pin surface should be covered with new solder		Conforms to 8.4 Solder temperature: 245 ± 5°C Dipping duration: 5 ± 0.5 sec. Dipped up to 1.6 mm from for the lower end of the capacitor.
Soldering Heat Resistance		Capacitance	Satisfy initial standard value	Conforms to 8.5 Solder temperature: 260 ± 10°C Dipping duration: 10 ± 1 sec. Dipped up to 1.6 mm from for the lower end of the capacitor.
		Equivalent series resistance		
		Current (30-minute value)		
		Appearance		
Temperature Cycle		Capacitance	Satisfy initial standard value	Conforms to 9.3 Temperature condition: -25°C → normal temperature → +70°C → normal temperature Number of cycles: 5 cycles
		Equivalent series resistance		
		Current (30-minute value)		
		Appearance		
Humidity Resistance		Capacitance	Within ±20% of initial value 1.2 or less times initial standard value 1.2 or less times initial standard value No obvious abnormality	Conforms to 9.5 Temperature: 40 ± 2°C Relative humidity: 90 to 95% RH Test duration: 240 ± 8 hours
		Equivalent series resistance		
		Current (30-minute value)		
		Appearance		
High Temperature Load		Capacitance	Within 30% of initial value Twice or less times initial standard value Twice or less times initial standard value No obvious abnormality	Conforms to 9.10 Temperature: 70 ± 2°C Voltage applied: 3.5 Vdc Series protection resistance: 0 Ω Test duration: 1000 ⁺⁸ hours
		Equivalent series resistance		
		Current (30-minute value)		
		Appearance		



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Specifications: FM Series FME Type

Item		Specifications		Test Conditions Conforming JIS C 5102 ¹⁹⁹⁴
Operating Temperature Range		-25°C to +70°C		
Maximum Operating Voltage		5.5 VDC		
Nominal Capacitance Range		Refer to standard ratings		
Capacitance Allowance		+80%, -20%		Refer to characteristics measuring method.
Equivalent Series Resistance		Refer to standard ratings		Refer to characteristics measuring method.
Current (30-minute value)		Refer to standard ratings		Refer to characteristics measuring method.
Surge Voltage		Capacitance	More than 90% of initial requirement	Conforms to 7.14 Surge Voltage: 7.4 V Temperature: 70 ± 2°C Charges: 30 sec. Discharges: 9 min. 30 sec. Number of cycles 1000 cycles. Series resistance: 0.022 F: 560 Ω 0.047 F: 300 Ω Discharge resistance: 0 Ω
		Equivalent series resistance	Not to exceed 120% of initial requirement	
		Current (30-minute value)	Not to exceed 120% of initial requirement	
		Appearance	No obvious abnormality	
Temperature Variation of Characteristics	Phase 2	Capacitance	50% or higher of initial value	Conforms to 7.12 Phase 1: +25 ± 2°C Phase 2: -25 ± 2°C Phase 4: +25 ± 2°C Phase 5: +70 ± 2°C Phase 6: +25 ± 2°C
		Equivalent series resistance	3 or less times initial value	
	Phase 5	Capacitance	150% or below of initial value	
		Equivalent series resistance	Satisfy initial standard value	
	Phase 6	Current (30-minute value)	1.5 CV (mA) or below	
		Capacitance	Within ±20% of initial value	
		Equivalent series resistance	Satisfy initial standard value	
		Current (30-minute value)	Satisfy initial standard value	
Lead Strength (Tensile)		No loosening nor permanent damage of the leads		Conforms to 8.1.2 (1) 1 kg 10 sec
Vibration Resistance		Capacitance	Satisfy initial standard value	Conforms to 8.2.3 Frequency: 10 to 55 Hz Test duration: 6 hours
		Equivalent series resistance		
		Current (30-minute value)		
		Appearance	There should be no considerable abnormality	
Solderability		3/4 or more of the pin surface should be covered with new solder		Conforms to 8.4 Solder temperature: 245 ± 5°C Dipping duration: 5 ± 0.5 sec. Dipped up to 1.6 mm from the lower end of the capacitor.
Soldering Heat Resistance		Capacitance	Satisfy initial standard value	Conforms to 8.5 Solder temperature: 260 ± 10°C Dipping duration: 10 ± 1 sec. Dipped up to 1.6 mm from the lower end of the capacitor.
		Equivalent series resistance		
		Current (30-minute value)		
		Appearance	No obvious abnormality	
Temperature Cycle		Capacitance	Satisfy initial standard value	Conforms to 9.3 Temperature condition: -25°C → normal temperature → +70°C → normal temperature Number of cycles: 5 cycles
		Equivalent series resistance		
		Current (30-minute value)		
		Appearance	No obvious abnormality	
Humidity Resistance		Capacitance	Within ±20% of initial value	Conforms to 9.5 Temperature: 40 ± 2°C Relative humidity: 90 to 95% RH Test duration: 240 ± 8 hours
		Equivalent series resistance	1.2 or less times initial standard value	
		Current (30-minute value)	1.2 or less times initial standard value	
		Appearance	No obvious abnormality	
High Temperature Load		Capacitance	Within 30% of initial value	Conforms to 9.10 Temperature: 70 ± 2°C Voltage applied: 5.5 Vdc Series protection resistance: 0 Ω Test duration: 1000 ⁺⁶⁰ ₀ hours
		Equivalent series resistance	Twice or less times initial standard value	
		Current (30-minute value)	Twice or less times initial standard value	
		Appearance	No obvious abnormality	



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Specifications: FM Series FMR Type

Item	Specifications		Test Conditions Conforming to JIS C 5102-1994	
Operating Temperature Range	-40°C to +85°C			
Maximum Operating Voltage	5.5 VDC			
Nominal Capacitance Range	Refer to standard ratings			
Capacitance Allowance	+80%, -20%		Refer to characteristics measuring method.	
Equivalent Series Resistance	Refer to standard ratings		Refer to characteristics measuring method.	
Current (30-minutes value)	Refer to standard ratings		Refer to characteristics measuring method.	
Surge Voltage	Capacitance	More than 90% of initial requirement	Conforms to 7.14 Surge Voltage: 6.3 V Temperature: 85 ± 2°C Charge: 30 sec. Discharge: 9 min. 30 sec. Number of cycles 1000 cycles. Series resistance: 300 Ω Discharge resistance: 0 Ω	
	Equivalent series resistance	Not to exceed 120% of initial requirement		
	Current (30-minute value)	Not to exceed 120% of initial requirement		
	Appearance	No obvious abnormality		
Temperature Variation of Characteristics	Phase 2	Capacitance	50% or higher initial value	Conforms to 7.12 Phase 1: +25 ± 2°C Phase 2: -25 ± 2°C Phase 3: -40 ± 2°C Phase 4: +25 ± 2°C Phase 5: +85 ± 2°C Phase 6: +25 ± 2°C
		Equivalent series resistance	4 or less times initial value	
	Phase 3	Capacitance	30% or higher initial value	
		Equivalent series resistance	7 or less times initial value	
	Phase 5	Capacitance	200% or below initial value	
		Equivalent series resistance	Satisfy initial standard value	
		Current (30-minute value)	1.5 CV (mA) or below	
	Phase 6	Capacitance	Within ±20% of initial value	
		Equivalent series resistance	Satisfy initial standard value	
		Current (30-minute value)	Satisfy initial standard value	
Lead Strength (Tensile)	No loosening nor permanent damage of the leads		Conforms to 8.1.2 (1) 1 kg 10sec.	
Vibration Resistance	Capacitance	Satisfy initial standard value	Conforms to 8.2.3 Frequency : 10 to 55 Hz Test duration : 6 hours	
	Equivalent series resistance			
	Current (30-minute value)			
	Appearance			No obvious abnormality
Solderability	3/4 or more of the pin surface should be covered with new solder.		Conforms to 8.4 Solder temperature: 245 ± 5°C Dipping duration: 5 ± 0.5 sec. Dipped up to 1.6 mm from the lower end of the capacitor.	
Soldering Heat Resistance	Capacitance	Satisfy initial standard value	Conforms to 8.5 Solder temperature: 260 ± 10°C Dipping duration: 10 ± 1 sec. Dipped up to 1.6 mm from the lower end of the capacitor.	
	Equivalent series resistance			
	Current (30-minute value)			
	Appearance			No obvious abnormality
Temperature Cycle	Capacitance	Satisfy initial standard value	Conforms to 9.3 Temperature condition: -40°C → normal temperature → +85°C → normal temperature Number of cycles: 5 cycles	
	Equivalent series resistance			
	Current (30-minute value)			
	Appearance			No obvious abnormality
Humidity Resistance	Capacitance	Within 20% of initial value	Conforms to 9.5 Temperature: 40 ± 2°C Relative humidity: 90 to 95% RH Test duration: 240 ± 8 hours	
	Equivalent series resistance	1.2 or less times initial standard value		
	Current (30-minute value)	1.2 or less times initial standard value		
	Appearance	No obvious abnormality		
High Temperature Load	Capacitance	Within 30% of initial value	Conforms to 9.10 Temperature: 85 ± 2°C Voltage applied: 5.5 Vdc Series protection resistance: 0 Ω Test duration: 1000 ⁴⁸ hours	
	Equivalent series resistance	Twice or less times initial standard value		
	Current (30-minute value)	Twice or less times initial standard value		
	Appearance	No obvious abnormality		
Voltage Holding Characteristics (Self Discharge)	Voltage between terminal leads higher than 4.2 V		Charging condition	Voltage applied: 5.0 VDC Series resistance: 0 Ω Charging time: 24hours
			Storage	Time: 24hours Temperature: Lower than 25°C Humidity: Lower than 70%RH



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Specifications: FM Series 6.5V Type

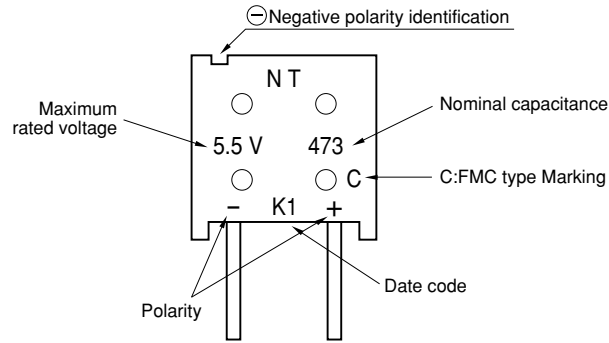
Item		Specifications		Test Conditions Conforming to JIS C 5102-1994
Operating Temperature Range		-25°C to +70°C		
Maximum Operating Voltage		6.5 VDC		
Nominal Capacitance Range		Refer to standard ratings		
Capacitance Allowance		+80%, -20%		Refer to characteristics measuring method.
Equivalent Series Resistance		Refer to standard ratings		Refer to characteristics measuring method.
Current (30-minutes value)		Refer to standard ratings		Refer to characteristics measuring method.
Surge Voltage		Capacitance	More than 90% of initial requirement	Conforms to 7.14 Surge Voltage: 7.4 V Temperature: 70 ± 2°C Charge: 30 sec. Discharge: 9 min. 30 sec. Number of cycles 1000 cycles. Series resistance: 0.047 F: 300 Ω Discharge resistance: 0 Ω
		Equivalent series resistance	Not to exceed 120% of initial requirement	
		Current (30-minute value)	Not to exceed 120% of initial requirement	
		Appearance	No obvious abnormality	
Temperature Variation of Characteristics	Phase 2	Capacitance	50% or higher of initial value	Conforms to 7.12 Phase 1: +25 ± 2°C Phase 2: -25 ± 2°C Phase 4: +25 ± 2°C Phase 5: +70 ± 2°C Phase 6: +25 ± 2°C
		Equivalent series resistance	4 or less times initial value	
	Phase 5	Capacitance	200% or below of initial value	
		Equivalent series resistance	Satisfy initial standard value	
	Phase 6	Current (30-minute value)	1.5 CV (mA) or below	
		Capacitance	Within ±20% of initial value	
		Equivalent series resistance	Satisfy initial standard value	
		Current (30-minute value)	Satisfy initial standard value	
Lead Strength (Tensile)		No loosening nor permanent damage of the leads		Conforms to 8.1.2 (1) 1 kg 10sec.
Vibration Resistance		Capacitance	Satisfy initial standard value	Conforms to 8.2.3 Frequency : 10 to 55 Hz Test duration : 6 hours
		Equivalent series resistance		
		Current (30-minute value)		
		Appearance	No obvious abnormality	
Solderability		3/4 or more of the pin surface should be covered with new solder		Conforms to 8.4 Solder temperature: 245 ± 5°C Dipping duration: 5 ± 0.5 sec. Dipped up to 1.6 mm from the lower end of the capacitor.
Soldering Heat Resistance		Capacitance	Satisfy initial standard value	Conforms to 8.5 Solder temperature: 260 ± 10°C Dipping duration: 10 ± 1 sec. Dipped up to 1.6 mm from the lower end of the capacitor.
		Equivalent series resistance		
		Current (30-minute value)		
		Appearance	No obvious abnormality	
Temperature Cycle		Capacitance	Satisfy initial standard value	Conforms to 9.3 Temperature condition: -25°C → normal temperature → +70°C → normal temperature Number of cycles: 5 cycles
		Equivalent series resistance		
		Current (30-minute value)		
		Appearance	No obvious abnormality	
Humidity Resistance		Capacitance	Within 20% of initial value	Conforms to 9.5 Temperature: 40 ± 2°C Relative humidity: 90 to 95% RH Test duration: 240 ± 8 hours
		Equivalent series resistance	1.2 or less times initial standard value	
		Current (30-minute value)	1.2 or less times initial standard value	
		Appearance	No obvious abnormality	
High Temperature Load		Capacitance	Within 30% of initial value	Conforms to 9.10 Temperature: 70 ± 2°C Voltage applied: 6.5 Vdc Series protection resistance: 0 Ω Test duration: 1000 ⁺⁴⁸ ₀ hours
		Equivalent series resistance	Twice or less times initial standard value	
		Current (30-minute value)	Twice or less times initial standard value	
		Appearance	No obvious abnormality	



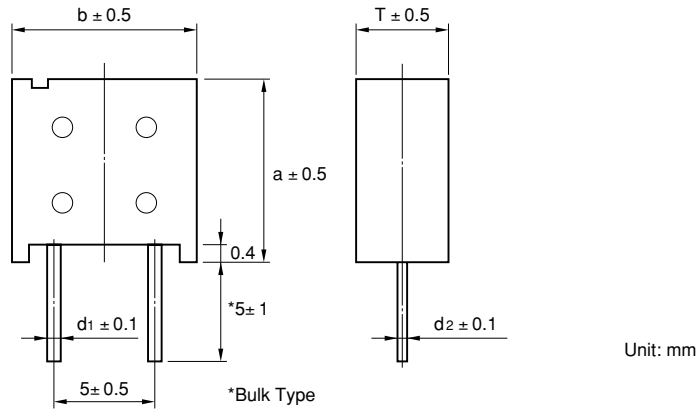
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● FMC Type

Markings



Dimensions



Standard Ratings

Part Number	Max. Operating Voltage (VDC)	Nominal Capacitance		Max. ESR (at 1 kHz) (Ω)	Max. Current at 30 minutes (mA)	Voltage Holding Characteristic Min. (V)	a (mm)	b (mm)	T (mm)	d1 (mm)	d2 (mm)	Weight (g)
		Charge System (F)	Discharge System (F)									
FMC0H473ZF FMC0H473ZFTP ()	5.5	0.047	0.062	less than 100	less than 0.071	more than 4.2V	11.5	10.5	5.0	0.5	0.4	1.3
FMC0H104ZF FMC0H104ZFTP ()	5.5	0.10	0.13	less than 50	less than 0.15	more than 4.2V	11.5	10.5	6.5	0.5	0.4	1.6
FMC0H334ZF FMC0H334ZFTP ()	5.5	—	0.33	less than 25	less than 0.50	more than 4.2V	15.0	14.0	9.0	0.6	0.6	3.5

Chip parts applicable to treatment in bond hardening furnace (160 ± 5°C for 120 ± 10 seconds)

Note: To complete part number, insert lead length H. (16 or 18 mm: Refer to Taping Specification on page 26 or 27.)



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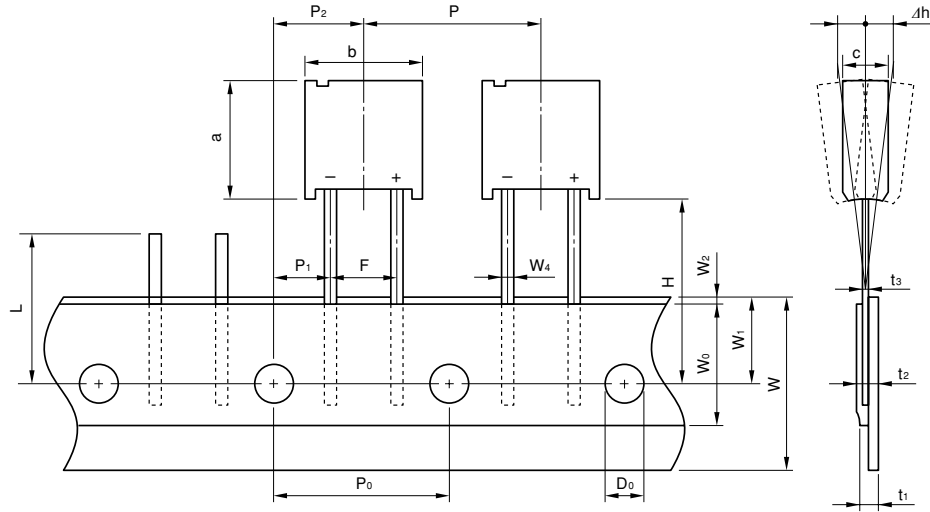
Specifications: FM Series FMC Type

Item		Specifications		Test Conditions Conforming to JIS C 5102 ¹⁹⁹⁴	
Operating Temperature Range		-25°C to +70°C			
Maximum Operating Voltage		5.5 VDC			
Nominal Capacitance Range		Refer to standard ratings			
Capacitance Allowance		+80%, -20%		Refer to characteristics measuring method.	
Equivalent Series Resistance		Refer to standard ratings		Refer to characteristics measuring method.	
Current (30-minutes value)		Refer to standard ratings		Refer to characteristics measuring method.	
Surge Voltage		Capacitance	More than 90% of initial requirement	Conforms to 7.14 Surge Voltage: 6.3 V Temperature: 70 ± 2°C Charges: 30 sec. Discharges: 9 min. 30 sec. Number of cycles 1000 cycles. Series resistance: 0.047 F: 300 Ω 0.1 F: 150 Ω 0.33 F: 51 Ω Discharge resistance: 0 Ω	
		Equivalent series resistance	Not to exceed 120% of initial requirement		
		Current (30-minute value)	Not to exceed 120% of initial requirement		
		Appearance	No obvious abnormality.		
Temperature Variation of Characteristics	Phase 2	Capacitance	50% or higher of initial value	Conforms to 7.12 Phase 1: +25 ± 2°C Phase 2: -25 ± 2°C Phase 4: +25 ± 2°C Phase 5: +70 ± 2°C Phase 6: +25 ± 2°C	
		Equivalent series resistance	4 or less times initial value		
	Phase 5	Capacitance	200% or below of initial value		
		Equivalent series resistance	Satisfy initial standard value		
	Phase 6	Current (30-minute value)	1.5 CV (mA) or below		
		Capacitance	Within ±20% of initial value		
		Equivalent series resistance	Satisfy initial standard value		
		Current (30-minute value)	Satisfy initial standard value		
		Current (30-minute value)	Satisfy initial standard value		
Lead Strength (Tenile)		No loosening nor permanent damage of the leads		Conforms to 8.1.2 (1) 1 kg 10 sec	
Vibration Resistance		Capacitance	Satisfy initial standard value	Conforms to 8.2.3 Frequency: 10 to 55 Hz Test duration: 6 hours	
		Equivalent series resistance			
		Current (30-minute value)			
		Appearance			There should be no considerable abnormality
Solderability		3/4 or more of the pin surface should be covered with new solder		Conforms to 8.4 Solder temperature: 245 ± 5°C Dipping duration: 5 ± 0.5 sec. Dipped up to 1.6 mm from the lower end of the capacitor.	
Soldering Heat Resistance		Capacitance	Satisfy initial standard value	Conforms to 8.5 Solder temperature: 260 ± 10°C Dipping duration: 10 ± 1 sec. Dipped up to 1.6 mm from the lower end of the capacitor.	
		Equivalent series resistance			
		Current (30-minute value)			
		Appearance			No obvious abnormality
Temperature Cycle		Capacitance	Satisfy initial standard value	Conforms to 9.3 Temperature condition: -25°C → normal temperature → +70°C → normal temperature Number of cycles: 5 cycles	
		Equivalent series resistance			
		Current (30-minute value)			
		Appearance			No obvious abnormality
Humidity Resistance		Capacitance	Within ±20% of initial value	Conforms to 9.5 Temperature: 40 ± 2°C Relative humidity: 90 to 95% RH Test duration: 240 ± 8 hours	
		Equivalent series resistance			1.2 or less times initial standard value
		Current (30-minute value)			1.2 or less times initial standard value
		Appearance			No obvious abnormality
High Temperature Load		Capacitance	Within 30% of initial value	Conforms to 9.10 Temperature: 70 ± 2°C Voltage applied: 5.5 Vdc Series protection resistance: 0 Ω Test duration: 1000 ⁴⁸ hours	
		Equivalent series resistance			Twice or less times initial standard value
		Current (30-minute value)			Twice or less times initial standard value
		Appearance			No obvious abnormality
Voltage Holding Characteristics (Self Discharge)		Voltage between terminal leads higher than 4.2V		Charging condition	Voltage applied: 5.0 VDC Series resistance: 0 Ω Charging time: 24hours
				Storage	Time: 24hours Temperature: Lower than 25°C Humidity: Lower than 70%RH



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Taping Specification (except FMC0H334ZFTP())



Unit : mm

Item	Symbol	Value	Tolerance	Remarks
Component Height	a	11.5	±0.5	
Component Width	b	10.5	±0.5	
Component Thickness	C	-	±0.5	5.5 V Type: 5.0/0.010 F~0.047 F, 6.5/0.047 F 3.5 V Type: 5.0/0.047 F~0.10 F, 6.5/0.22 F FME Type: 5.0/0.022 F~0.047 F 6.5 Type: 6.5/0.047 F FMR Type: 6.5/0.047 F FMC Type: 5.0/0.047 F, 6.5/0.10 F
Lead-wire Width	W ₄	0.5	±0.1	
Lead-wire Thickness t ₃	t ₃	0.4	±0.1	
Pitch of Component	P	12.7	±1.0	
Sprocket Pitch	P ₀	12.7	±0.3	
Sprocket Hole Center to Lead	P ₁	3.85	±0.7	
Sprocket Hole to Component Center	P ₂	6.35	±1.3	
Lead Spacing	F	5.0	±0.5	
Component Alignment	Δh	2.0 Max.	-	Including tilting caused by bending of lead wire
Tape Width	W	18.0	+1.0 -0.5	
Hold-down tape Width	W ₀	12.5 Min.	-	
Sprocket Hole Position	W ₁	9.0	±0.5	
Hold-down Tape Position	W ₂	3.0 Max.	-	No protrusion of tape
Height of Component from Tape Center	H	16.0	±0.5	
		18.0	±0.5	
Sprocket Hole Diameter	D ₀	φ4.0	±0.2	
Total Tape Thickness	t ₁	0.7	±0.2	
	t ₂	1.5 Max.	-	
Length of Shipped Lead	L	11.0 Max.	-	

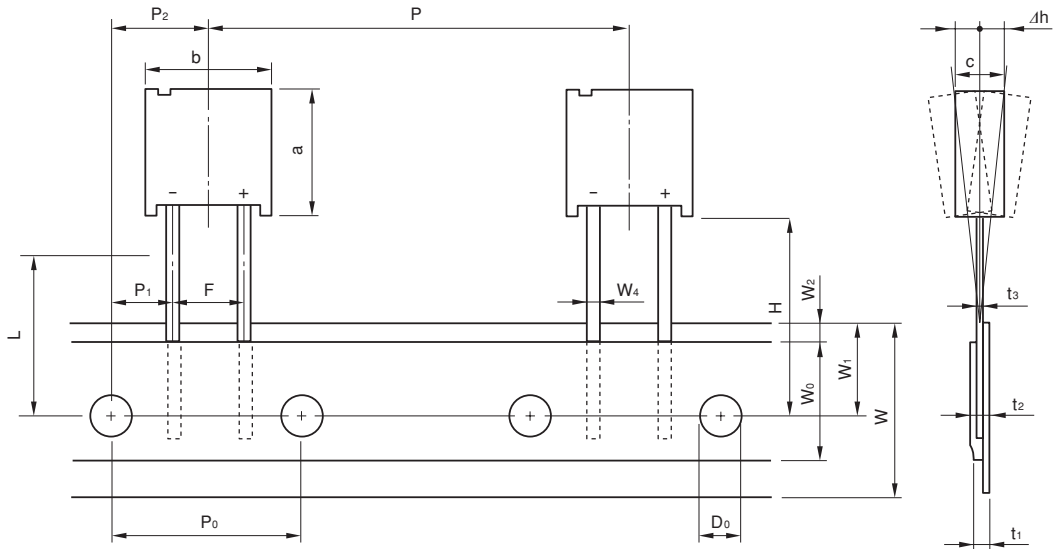
Packing Quantity

1000 pcs. / box



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Taping Specifications [FMC0H334ZFTP()]



Unit : mm

Item	Symbol	Value	Tolerance	Remarks
Component Height	a	15.0	±0.5	
Component Width	b	14.0	±0.5	
Component Thickness	c	9.0	±0.5	
Lead-wire Width	W ₄	0.6	±0.1	
Lead-wire Thickness	t ₃	0.6	±0.1	
Pitch of Component	P	25.4	±1.0	
Sprocket Pitch	P ₀	12.7	±0.3	
Sprocket Hole Center to Lead	P ₁	3.85	±0.7	
Sprocket Hole to Component Center	P ₂	6.35	±1.3	
Lead Spacing	F	5.0	±0.5	
Component Alignment	Δ h	2.0 Max.	—	Including tilting caused by bending of lead wire
Tape Width	W	18.0	+1.0 -0.5	
Hold-down tape Width	W ₀	12.5 Min.	—	
Sprocket Hole Position	W ₁	9.0	±0.5	
Hold-down Tape Position	W ₂	3.0 Max.	—	No protrusion of tape
Height of Component from Tape Center	H	16.0	±0.5	
		18.0	±0.5	
Sprocket Hole Diameter	D ₀	φ4.0	±0.2	
Total tape thickness	t ₁	0.67	±0.2	
	t ₂	1.7 Max.	—	
Length of Shipped Lead	L	11.0 Max.	—	

Packing Quantity

400 pcs. / box



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