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

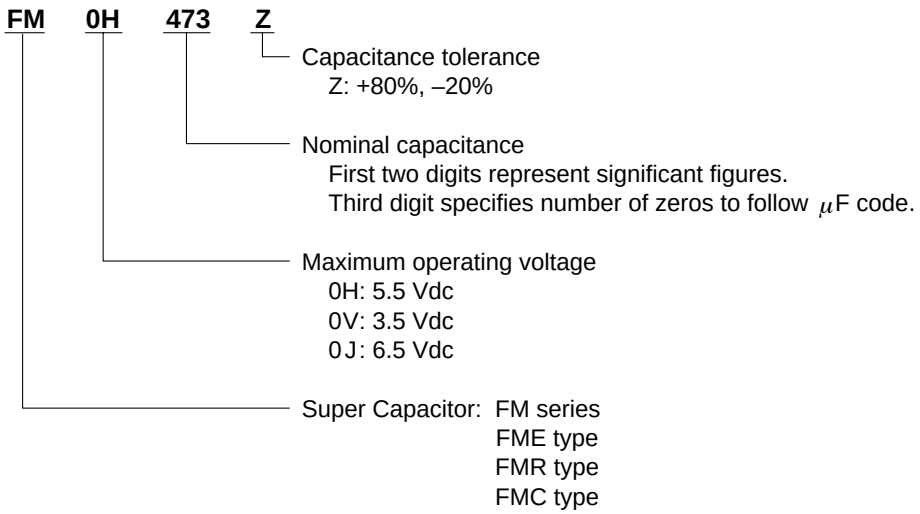
- High adaptability to automatic assembly
- Can be cleaned
- Excellent voltage holding characteristics ideal for long-time supply of 1 μA to several hundred μA (Except 3.5 V type, FME type)
- Space saving

Applications

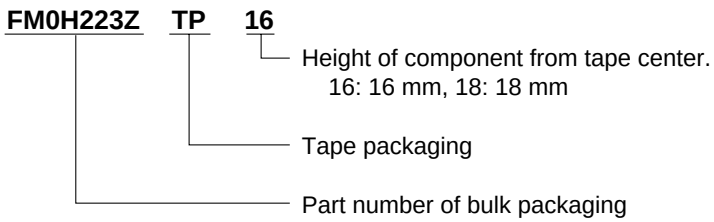
Backup of CMOS microcomputers, static RAMs, and DTSs

Part Number System

• Bulk



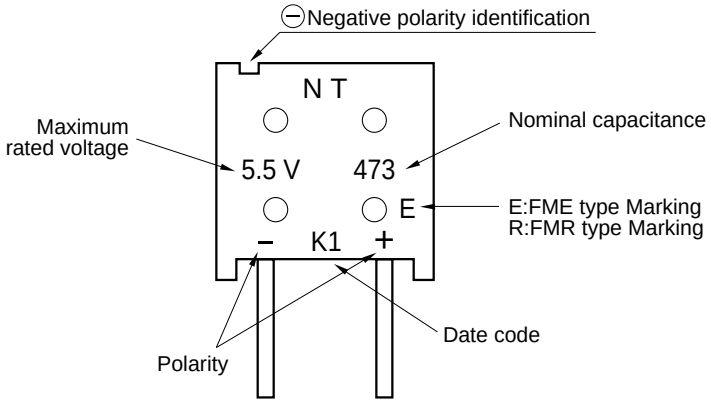
• Tape (Ammo Pack)



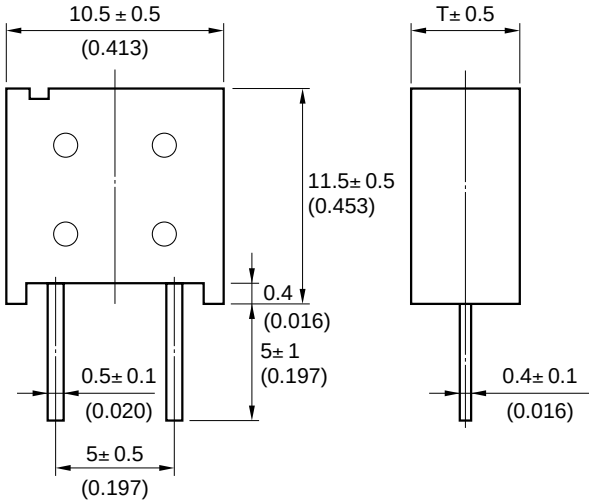
Number of Packed Capacitors

Tape: 1000 pcs./box

Markings



Dimensions And Standard Ratings



Unit: mm
(inch)

● 5.5 V Type

Part Number		Max. Rated 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)
	Ammo pack		Charge System (F)	Discharge System (F)					
FM0H103Z	FM0H103ZTP ( )	5.5	0.01	0.014	300	0.015	4.2	5.0 (0.197)	1.3 (0.046)
FM0H223Z	FM0H223ZTP ( )	5.5	0.022	0.028	200	0.033	4.2	5.0 (0.197)	1.3 (0.046)
FM0H473Z	FM0H473ZTP ( )	5.5	0.047	0.06	200	0.071	4.2	5.0 (0.197)	1.3 (0.046)
FM0H104Z	FM0H104ZTP ( )	5.5	0.10	0.13	100	0.15	4.2	6.5 (0.256)	1.6 (0.056)
FM0H224Z	FM0H224ZTP ( )	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 34.)

● 3.5 V Type

Part Number		Max. Rated Voltage (VDC)	Nominal Capacitance		Max. ESR (at 1 kHz) (Ω)	Max. Current at 30 minutes (mA)	T mm (inch)	Weight g (oz)
	Ammo pack		Charge System (F)	Discharge System (F)				
FM0V473Z	FM0V473ZTP ( )	3.5	0.047	0.06	200	0.042	5.0 (0.197)	1.3 (0.046)
FM0V104Z	FM0V104ZTP ( )	3.5	0.10	0.13	100	0.090	5.0 (0.197)	1.3 (0.046)
FM0V224Z	FM0V224ZTP ( )	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 34.)

● FME Type (Backup Large Current , mA Order)

Part Number		Max. Rated Voltage (VDC)	Nominal Capacitance		Max. ESR (at 1 kHz) (Ω)	Max. Current at 30 minutes (mA)	T mm (inch)	Weight g (oz)
	Ammo pack		Charge System (F)	Discharge System (F)				
FME0H223Z	FME0H223ZTP ( )	5.5	0.022	0.028	40	0.033	5.0 (0.197)	1.3 (0.046)
FME0H473Z	FME0H473ZTP ( )	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 34.)

● FMR Type (Extended Operating Temperature range)

Part Number		Max. Rated 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)
	Ammo pack		Charge System (F)	Discharge System (F)					
FMR0H473Z	FMR0H473ZTP ( )	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 34.)

● FM 6.5V Type

Part Number		Max. Rated Voltage (VDC)	Nominal Capacitance		Max. ESR (at 1 kHz) (Ω)	Max. Current at 30 minutes (mA)	T mm (inch)	Weight g (oz)
	Ammo pack		Charge System (F)	Discharge System (F)				
FM0J473Z	FM0J473ZTP ( )	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 34.)

Specifications 5.5 V Type

Item		Standard		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		See standard list		
Capacitance Allowance		+80%, –20%		See characteristics measuring method.
Equivalent Series Resistance		See standard list		See characteristics measuring method.
Current (30-minutes value)		See standard list		See 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 3: –40 ± 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	Satisty initial standard value	
		Current (30-minute value)	1.5 CV (mA) or below	
	Phase 6	Capacitance	Within ±20% of initial value	
		Equivalent series resistance	Satisty initial standard value	
		Current (30-minute value)	Satisty initial standard value	
Lead Strengh (Tensile)		No loosening nor permanent damage of the leads		Conforms to 8.1.2 (1) 1 kg 10sec.
Vibration Resistance		Capacitance	Satisty 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: 230 ± 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	Satisty 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	Satisty 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 obuious 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}_{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	
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

Specifications 3.5 V Type

Item		Standard		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		See standard list		
Capacitance Allowance		+80%, –20%		See characteristics measuring method.
Equivalent Series Resistance		See standard list		See characteristics measuring method.
Current (30-minutes value)		See standard list		See 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 3: –40 ± 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	Satisty initial standard value	
		Current (30-minute value)	1.5 CV (mA) or below	
	Phase 6	Capacitance	Within ±20% of initial value	
		Equivalent series resistance	Satisty initial standard value	
		Current (30-minute value)	Satisty initial standard value	
Lead Strengh (Tensile)		No loosening nor permanent damage of the leads		Conforms to 8.1.2 (1) 1 kg 10 sec
Vibration Resistance		Capacitance	Satisty 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 considerable abnormality	
Solderability		3/4 or more of the pin surface should be covered with new solder		Conforms to 8.4 Solder temperature: 230 ± 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	Satisty 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	No obvious abnormality	
Temperature Cycle		Capacitance	Satisty 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: 3.5 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	

Specifications FME Type

Item		Standard		Test Conditions Conforming JIS C 5102-1994
Operating Temperature Range		–25°C to +70°C		
Maximum Operating Voltage		5.5 VDC		
Nominal Capacitance Range		See standard list		
Capacitance Allowance		+80%, –20%		See characteristics measuring method.
Equivalent Series Resistance		See standard list		See characteristics measuring method.
Current (30-minutes value)		See standard list		See 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 Chargs: 30 sec. Dischargs: 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 3: –40 ± 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	Satisty initial standard value	
		Current (30-minute value)	1.5 CV (mA) or below	
	Phase 6	Capacitance	Within ±20% of initial value	
		Equivalent series resistance	Satisty initial standard value	
		Current (30-minute value)	Satisty initial standard value	
Lead Strengh (Tensile)		No loosening nor permanent damage of the leads		Conforms to 8.1.2 (1) 1 kg 10 sec
Vibration Resistance		Capacitance	Should satisty 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: 230 ± 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	Satisty 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	Satisty 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: $1000\ ^{+48}_{0}$ 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	

Specifications FMR Type

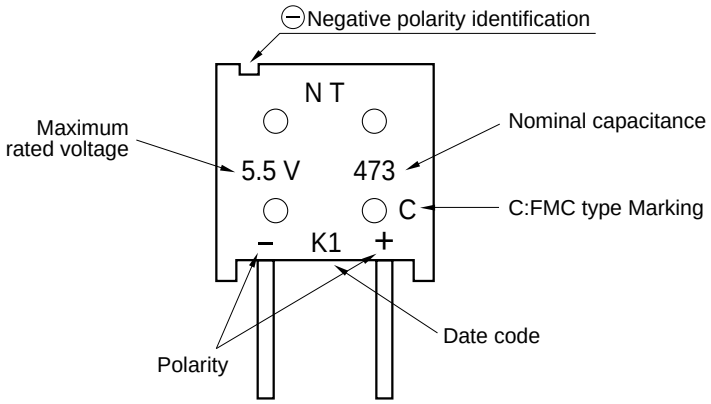
Item		Standard		Test Conditions Conforming to JIS C 5102-1994
Operating Temperature Range		–40°C to +85°C		
Maximum Operating Voltage		5.5 VDC		
Nominal Capacitance Range		See standard list		
Capacitance Allowance		+80%, –20%		See characteristics measuring method.
Equivalent Series Resistance		See standard list		See characteristics measuring method.
Current (30-minutes value)		See standard list		See 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: 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 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 higher 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 standard value	
		Equivalent series resistance	Satisfy initial standard value	
		Current (30-minute value)	Satisfy initial standard value	
Lead Strengh (Tensile)		No loosening nor permanent damage of the leads		Conforms to 8.1.2 (1) 1 kg 10sec.
Vibration Resistance		Capacitance	Satisty 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: 230 ± 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	Satisty 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	Satisty 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 obuious 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: $1000\ ^{+48}_{0}$ 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	
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

Specifications FM 6.5V Type

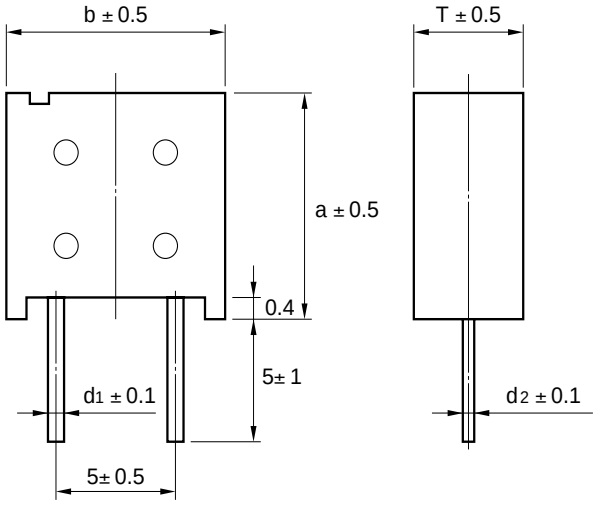
Item		Standard		Test Conditions Conforming to JIS C 5102-1994
Operating Temperature Range		–25°C to +70°C		
Maximum Operating Voltage		6.5 VDC		
Nominal Capacitance Range		See standard list		
Capacitance Allowance		+80%, –20%		See characteristics measuring method.
Equivalent Series Resistance		See standard list		See characteristics measuring method.
Current (30-minutes value)		See standard list		See 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 3: –40 ± 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	Satisty initial standard value	
		Current (30-minute value)	1.5 CV (mA) or below	
	Phase 6	Capacitance	Within ±20% of initial value	
		Equivalent series resistance	Satisty initial standard value	
		Current (30-minute value)	Satisty initial standard value	
Lead Strengh (Tensile)		No loosening nor permanent damage of the leads		Conforms to 8.1.2 (1) 1 kg 10sec.
Vibration Resistance		Capacitance	Satisty 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: 230 ± 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	Satisty 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	Satisty 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 obuious 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	

● **FMC Type**

Markings



Dimensions And Standard Ratings



Unit: mm

Part Number		Max. Rated Voltage (VDC)	Nominal Capacitance Charge System (F)	Discharge System (F)	Max. ESR (at 1 kHz) (Ω)	Max. Current at 30 minutes (mA)	Voltage Holding Characteristic Min. (V)	a (mm)	b (mm)	T (mm)	d_1 (mm)	d_2 (mm)	Weight (g)
	Ammo pack												
FMC0H473Z	FMC0H473ZTP( )	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
FMC0H104Z	FMC0H104ZTP( )	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
FMC0H334Z	FMC0H334ZTP( )	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

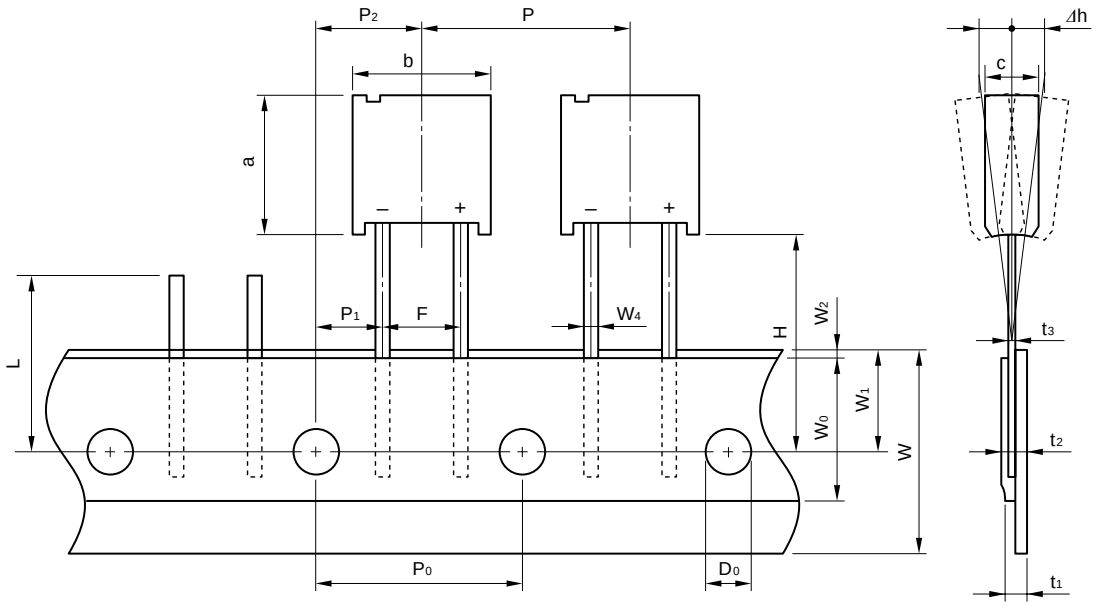
Chip parts applicable to treatment in bond hardening furnace (160 ± 5°C for 120 ±10 seconds)

Note: To complete part number, insert lead length H. (16 or 18 mm: Refer to Taping Specification on page 34 or 35.)

Specifications FMC Type

Item		Standard		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		0.047F , 0.10F , 0.33F		
Capacitance Allowance		+80%, –20%		See characteristics measuring method.
Equivalent Series Resistance		See standard list		See characteristics measuring method.
Current (30-minutes value)		See standard list		See 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 Chargs: 30 sec. Dischargs: 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 3: –40 ± 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	Satisty initial standard value	
		Current (30-minute value)	1.5 CV (mA) or below	
	Phase 6	Capacitance	Within ±20% of initial value	
		Equivalent series resistance	Satisty initial standard value	
		Current (30-minute value)	Satisty initial standard value	
Lead Strengh (Tenile)		No loosening nor permanent damage of the leads		Conforms to 8.1.2 (1) 1 kg 10 sec
Vibration Resistance		Capacitance	Should satisty 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: 230 ± 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	Satisty 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	Satisty 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}_{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	
Voltage Holding Characteristics (Self Dischage)		Voltage between terminal leads higher then 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

Taping Specification (Ammo pack) (except FMC0H334ZTP( ))



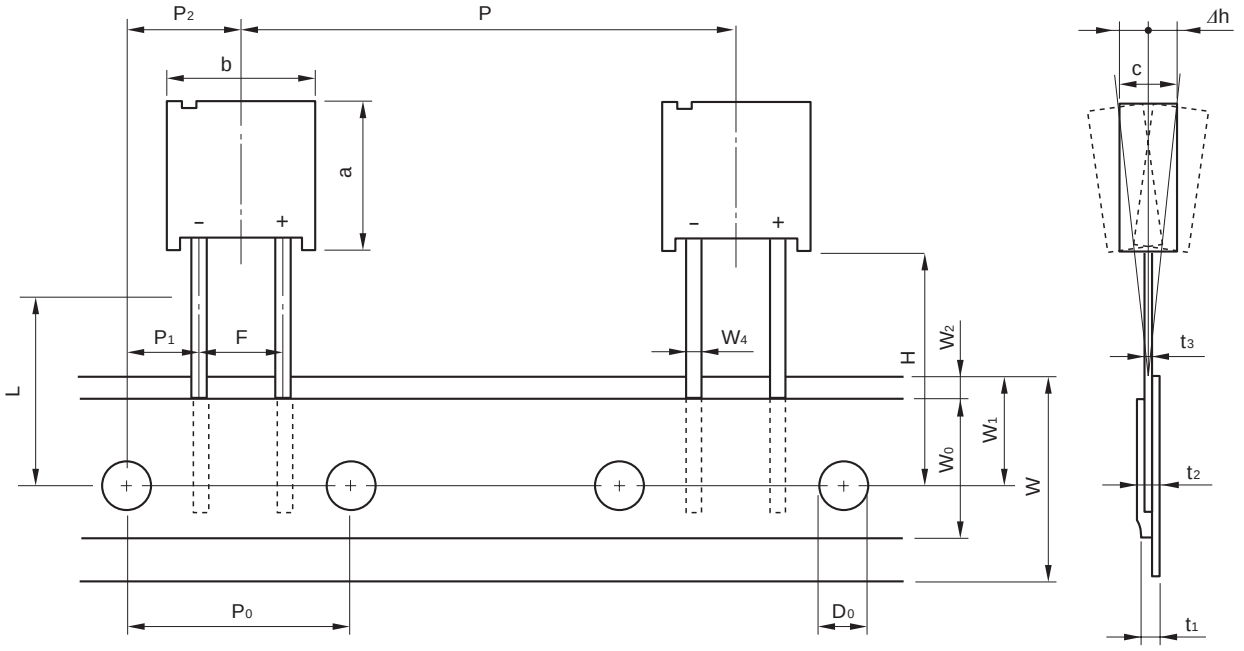
Unit : mm

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, 6.5/0.10 F~0.22 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: 6.5/0.022 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 tiltiing 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

Taping Specifications [FMC0H334ZTP( )]



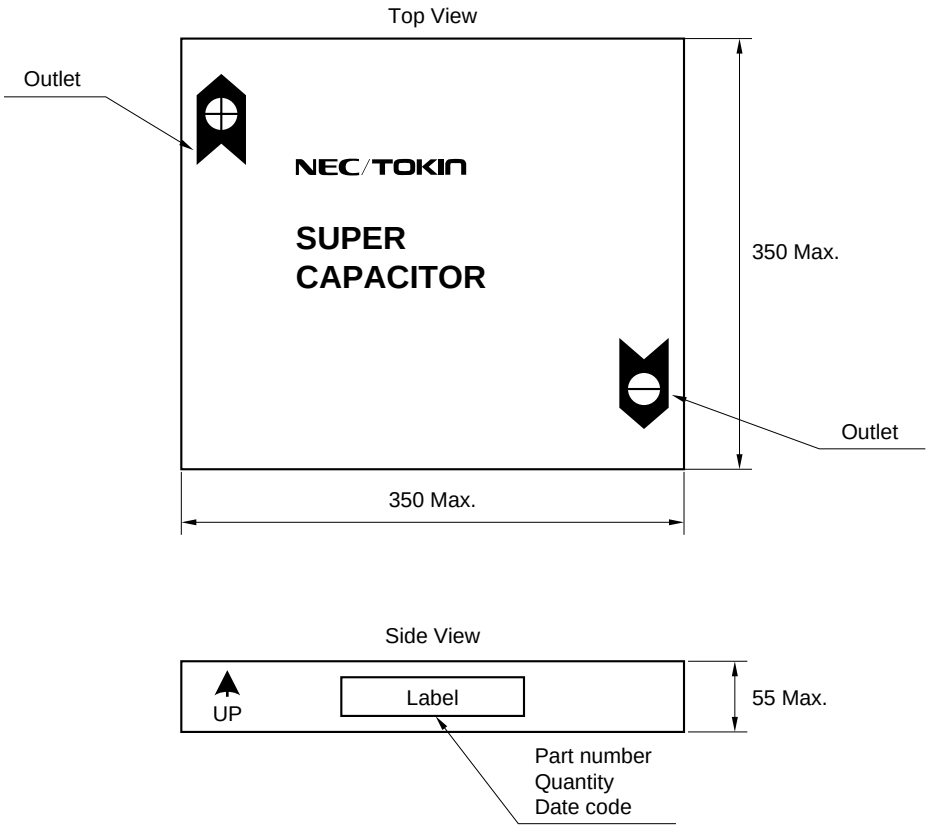
Unit : mm

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 tiltiing 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

Packing dimensions



Marking of Box

Marking shows the following items.

(a) Terminal direction
(b) Part number
(c) Quantity
(d) Date code
(e) Company logo

Packing Quantity :

1000 pcs. / box (Except FMC0H334ZTP( ))
400 pcs. / box (FMC0H334ZTP( ))