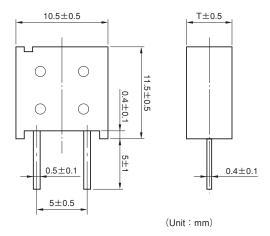
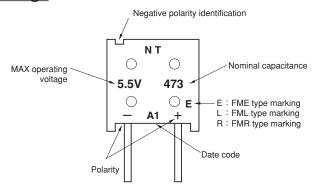
6.2 FM Series

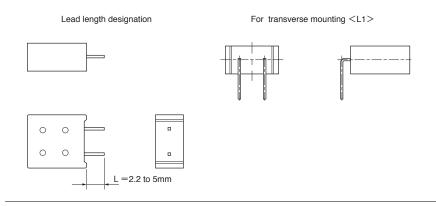
Dimensions



Markings



Lead terminal forming example





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Specifications

● 5.5V Type

Pa	art Number	operating cap		ninal citance	MAX ESR (at 1 kHz)	MAX current at 30 min.	Voltage holding	Т	Weight
Bulk	Ammo pack	voltage (Vdc)	Charge system(F)	Discharge system(F)	(Ω)	(mA)	characteristics (V)	(mm)	(g)
FM0H103ZF	FM0H103ZFTP ()	5.5	0.01	0.014	300	0.015	4.2	5.0	1.3
FM0H223ZF	FM0H223ZFTP ()	5.5	0.022	0.028	200	0.033	4.2	5.0	1.3
FM0H473ZF	FM0H473ZFTP ()	5.5	0.047	0.06	200	0.071	4.2	5.0	1.3
FM0H104ZF	FM0H104ZFTP ()	5.5	0.10	0.13	100	0.15	4.2	6.5	1.6
FM0H224ZF	FM0H224ZFTP ()	5.5	_	0.22	100	0.33	4.2	6.5	1.6

To complete the part number, insert lead length (16mm or 18mm) in to the "()"

● 3.5V Type

Pa	Part Number		MAX operating voltage Nominal capacitance		MAX ESR (at 1 kHz)	MAX current at 30 min.	Т	Weight	
Bulk	Ammo pack	(Vdc)	Charge system(F)	Discharge system(F)	(Ω)	(mA)	(mm)	(g)	
FM0V473ZF	FM0V473ZFTP ()	3.5	0.047	0.06	200	0.042	5.0	1.3	
FM0V104ZF	FM0V104ZFTP ()	3.5	0.10	0.13	100	0.090	5.0	1.3	
FM0V224ZF	FM0V224ZFTP ()	3.5	0.22	0.30	100	0.20	6.5	1.6	

To complete the part number, insert lead length (16mm or 18mm) in to the "()"

● 6.5V Type

Pa	art Number	MAX operating voltage	Nominal capacitance		MAX ESR (at 1 kHz)	MAX current at 30 min.	Т	Weight (g)	
Bulk	Ammo pack	(Vdc)	3-		(αι (Ω)	(mA)	(mm)		
FM0J473ZF	FM0J473ZFTP ()	6.5	0.047	0.062	200	0.071	6.5	1.6	

To complete the part number, insert lead length (16mm or 18mm) in to the "($\,$)"

● FME, FML Type (Buckup Large Current, mA Order)

Part Number		MAX operating voltage Nominal capacitance		MAX ESR	MAX current at 30 min.	Т	Weight		
Bulk	Ammo pack	(Vdc)	Charge Discharge system(F)		(Ω)	(mA)	(mm)	(g)	
FME0H223ZF	FME0H223ZFTP ()	5.5	0.022	0.028	40	0.033	5.0	1.3	
FME0H473ZF	FME0H473ZFTP ()	5.5	0.047	0.06	20	0.071	5.0	1.3	
FML0H333ZF	FML0H333ZFTP ()	5.5		0.033	6.5	0.050	5.0	1.3	

To complete the part number, insert lead length (16mm or 18mm) in to the "()"

● FMR Type (MAX Operating Temperature 85°C Type)

Pa	art Number	MAX Nomi operating capacit			MAX ESR	MAX current at 30 min.	Voltage holding	Т	Weight
Bulk	Ammo pack	voltage (Vdc)	Charge system(F)	Discharge system(F)	(Ω)	(mA)	characteristics (V)	(mm)	(g)
FMR0H473ZF	FMR0H473ZFTP ()	5.5	0.047	0.062	200	0.071	4.2	6.5	1.6
FMR0H104ZF	FMR0H104ZFTP ()	5.5	0.10		50	0.15	4.2	6.5	1.6
FMR0V104ZF	FMR0V104ZFTP ()	3.5	0.10		50	0.090	_	6.5	1.6

To complete the part number, insert lead length (16mm or 18mm) in to the "($\,$)"



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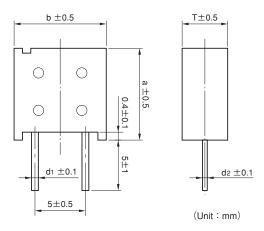
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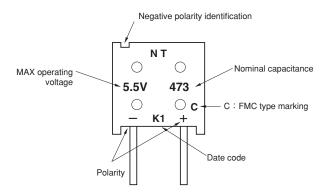
FMC Type

Chip parts applicable to treatment in bond hardening furnace (160 \pm 5 $^{\circ}$ C for 120 \pm 10 seonds)

Dimensions



Markings



Specifications

Pa	art Number	MAX Nominal operating capacitance			MAX ESR	MAX current at	Voltage holding	а	b	Т	d ₁	d ₂	Weight
Bulk	Ammo pack	voltage (Vdc)	Charge system(F)	Discharge system(F)	(Ω)	30 min. (mA)	characteristics (V)	(mm)	(mm)	(mm)	(mm)	(mm)	(g)
FMC0H473ZF	FMC0H473ZFTP ()	5.5	0.047	0.06	100	0.071	4.2	11.5	10.5	5.0	0.5	0.4	1.3
FMC0H104ZF	FMC0H104ZFTP ()	5.5	0.10	0.13	50	0.15	4.2	11.5	10.5	6.5	0.5	0.4	1.6
FMC0H334ZF	FMC0H334ZFTP ()	5.5	_	0.33	25	0.50	4.2	15.0	14.0	9.0	0.6	0.6	3.5

To complete the part number, insert lead length (16mm or 18mm) in to the "()"

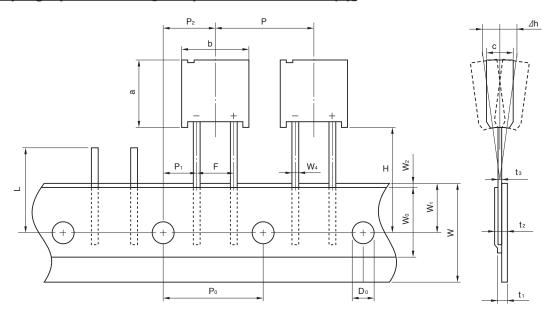


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Taping Specification [except FMC0H334ZFTP()]



(Unit: mm)

Item	Symbol	Value	Tolerance	Remarks
Component Height	а	11.5	±0.5	
Component Width	b	10.5	±0.5	
Component Thickness	С	_	±0.5	5.5 V type : 5.0/0.010F to 0.047F, 6.5/0.047F 3.5 V type : 5.0/0.047F to 0.10F, 6.5/0.22F FME type : 5.0/0.022F to 0.047F FML type : 5.0/0.033F 6.5 V type : 6.5/0.047F, 0.10F FMR type : 6.5/0.047F FMC type : 5.0/0.047F, 6.5/0.10F
Lead-wire Width	W ₄	0.5	±0.1	
Lead-wire Thickness	t ₃	0.4	±0.1	
Pitch between Component	Р	12.7	±1.0	
Sprocket Hole Pitch	P ₀	12.7	±0.3	
Sprocket Hole to Lead	P ₁	3.85	±0.7	
"	P ₂	6.35	±1.3	
Lead Spacing	F	5.0	±0.5	
Component Alignment	⊿h	2.0 Max.	_	Including tilting caused by bending 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.
Component's Bottom Line Position	Н	16.0	±0.5	
"	П	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.	_	
Defect Component Cut-off Position	L	11.0 Max.	_	



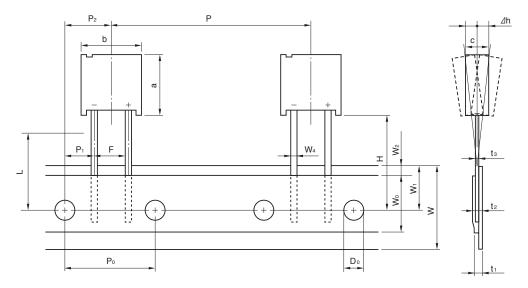
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<u>Taping Specification [except FMC0H334ZFTP ()]</u>



(Unit: mm)

				(Onit : Illiii
Item	Symbol	Value	Tolerance	Remarks
Component Height	а	15.0	±0.5	
Component Width	b	14.0	±0.5	
Component Thickness	С	9.0	±0.5	
Lead-wire Width	W ₄	0.6	±0.1	
Lead-wire Thickness	t ₃	0.6	±0.1	
Pitch between Component	Р	25.4	±1.0	
Sprocket Hole Pitch	P ₀	12.7	±0.3	
Sprocket Hole to Lead	P ₁	3.85	±0.7	
"	P ₂	6.35	±1.3	
Lead Spacing	F	5.0	±0.5	
Component Alignment	⊿h	2.0 Max.	_	Including tilting caused by bending 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
Component's Bottom Line Position	Н Н	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.	_	
Defect Component Cut-off Position	L	11.0 Max.	_	



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Specifications

Item	Series name	5.5V t	ype, 3.5V type, 6.5V type FMC type		FML, FME type	(0	Test conditions conforming to JIS C 5160-1)	
Category tempera	ture range	-25°C	to +70°C	-25°C	to +70°C	1		
MAX operating vo	-		, 3.5Vdc, 6.5Vdc	5.5Vdc	10 1 7 0 0			
Capacitance			0.010F to 0.33F 0.047F to 0.22F 0.047	0.022F,	0.033F, 0.047F	Refer to	"Measurement Conditions"	
Capacitance allow	/ance		, -20 %	+80 %	, -20 %	Refer to	Refer to "Measurement Conditions"	
ESR		Refer to	standard ratings	Refer to	standard ratings		ed at 1kHz, 10mA; See also rement Conditions"	
Current (30-minut	es value)	Refer to	standard ratings	Refer to	standard ratings	Refer to	"Measurement Conditions"	
	Capacitance	More th	nan 90% of initial ratings	More th	an 90% of initial ratings	Surge v	oltage: 4.0V (3.5V type)	
	ESR	Not to e	xceed 120% of initial ratings	Not to e	xceed 120% of initial ratings		: 6.3V (5.5V type) : 7.4V (6.5V type)	
	Current (30 minutes value)	Not to e	xceed 120% of initial ratings	Not to e	xceed 120% of initial ratings		: 30 sec.	
Surge	Appearance	No obv	ious abnormality	No obvious abnormality		Number Series r	ge : 9min 30sec. of cycles : 1000 esistance : 0.010F 1500Ω cscatance : 0.022F 560Ω $0.033F$ 510Ω $0.047F$ $0.068F$ $0.068F$ $0.088F$ $0.040F$ $0.088F$ $0.088F$ $0.098F$ 0.098	
	Capacitance ESR	Phase 2	50% or higher than initial value 400% or less than initial value	Phase 2	50% or higher than initial value 400% or less than initial value	Tempera	addre · 70±2 0	
	Capacitance	Phase		Phase		Conform	ns to 4.17	
Characteristics	ESR	3	0000/	3	0000/l th initiall	Phase1	: +25±2℃	
in different	Capacitance ESR	Phase	200% or less than initial value Satisfy initial ratings	Phase	200% or less than initial value Satisfy initial ratings		: -25±2℃ : +25±2℃	
temperature	Current (30 minutes value)	5	1.5CV (mA) or below	5	1.5CV (mA) or below	Phase5	: +70±2℃	
	Capacitance		Within ±20% of initial value		Within ±20% of initial value	Phase6	: +25±2℃	
	ESR	Phase 6	Satisfy initial ratings	Phase 6	Satisfy initial ratings	1		
	Current (30 minutes value) Satisfy initial ratings		Satisfy initial ratings	0	Satisfy initial ratings			
Lead strength (tensile)		No tern	ninal damage	No tern	ninal damage	Conform	ns to 4.9	
Vibration resistance	Capacitance ESR Current (30 minutes value)	Satisfy	initial ratings	Satisfy	initial ratings	Conforms to 4.13 Frequency: 10 to 55 Hz Testing time: 6 hours		
	Appearance	No obvious abnormality		No obv	ous abnormality			
Solderability		Over 3/4 of the terminal should be covered by the new solder		Over 3/4 of the terminal should be covered by the new solder		Conforms to 4.11 Solder temp: 245±5°C Dipping time: 5±0.5 sec. 1.6mm from the bottom should be dipped.		
Solder heat resistance	Capacitance ESR Current (30 minutes value)	Satisfy	initial ratings	Satisfy	initial ratings	Conforms to 4.10 Solder temp : 260±10 ℃		
resistance	Appearance	No obv	ious abnormality	No oby	ous abnormality		time: 10 ± 1 sec. from the bottom should be dipped.	
Temperature	Capacitance ESR		initial ratings		initial ratings		ns to 4.12 re condition : −25°C →Room temperature→	
cycle	Current (30 minutes value)	No ob.	ious abnormality	No ob.	ious abnormality	Number	+70 °C →Room temperature of cycles : 5 Cycles	
	Appearance		±20% of initial value		eous abnormality ±20% of initial value	+		
High temp. and	Capacitance ESR						ns to 4.14	
high humidity			xceed 120% of initial ratings		xceed 120% of initial ratings		ature:40±2℃ humidity:90 to 95%RH	
resistance	Current (30 minutes value)		xceed 120% of initial ratings		xceed 120% of initial ratings		time: 240±8 hours	
	Appearance		ious abnormality		ous abnormality	-		
High	Capacitance		±30% of initial value		±30% of initial value		ns to 4.15 ature : 70±2℃	
temperature	ESR		200% of initial ratings		200% of initial ratings	Voltage	applied: MAX operating voltage	
load	Current (30 minutes value)		200% of initial ratings		200% of initial ratings	Series protection resistance : 0 Ω Testing time : 1000+48Hours		
Solf dispharge characteristics terminal le		pe: Voltage between terminal leads higher than 4.2V	אטטטטע	ious abnormality	Charging condition	Voltage applied : 5.0Vdc (Terminal at the case's side be negative) Series resistance : 0 Ω Charging time : 24 hours Let stand for 24 hours in condition described below with terminals opened.		



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Specifications

Item	Series name		FMR type	Test cond	litions (conforming to JIS C 5160-1)		
Category temperature rai	nge	-40°C to -					
MAX operating voltage	.9-	5.5Vdc, 3.5					
Capacitance		0.047F, 0.10		Refer to "Me	asurement Conditions"		
Capacitance allowance		+80%, -2			asurement Conditions"		
				Measured at 1kHz, 10mA; See also "Measurement			
ESR			ndard ratings	Conditions"			
Current (30-minutes value	e)	Refer to sta	ndard ratings	-	asurement Conditions"		
	Capacitance	More than 9	00% of initial ratings	Surge voltage	e: 4.0V (3.5V type) : 6.3V (5.5V type)		
	ESR	Not to exce	ed 120% of initial ratings	Charge: 30			
0	Current (30 minutes value)	Not to exce	ed 120% of initial ratings	Discharge : 9			
Surge	Appearance	No obvious	abnormality		ance : $0.047F$ = 300Ω : $0.10F$ = 150Ω sistance : 0Ω		
	Capacitance	Phase 2	50% or higher than initial value				
	ESR		400% or less than initial value	Conforms to	4 17		
	Capacitance ESR	Phase 3	30% or higher than initial value Below 700% of the initial value	Phase1: +2			
Characteristics in	Capacitance		200% or less than initial value	Phase2: -2			
different temperature	ESR	Phase 5	Satisfy initial ratings	Phase3: -4			
	Current (30 minutes value)		1.5CV (mA) or below	Phase4: +2 Phase5: +7			
	Capacitance		Within ±20% of initial value	Phase6: +2			
	ESR	Phase 6	Satisfy initial ratings	4			
Current (30 minutes value)		NI- AiI	Satisfy initial ratings	0	4.0		
Lead strength (tensile)	0	No terminal	damage	Conforms to 4.9			
Vibration resistance	Capacitance ESR Current (30 minutes value)	Satisfy initia	al ratings	Conforms to Frequency :			
	Appearance	No obvious	abnormality	Testing time	: 6 hours		
Solderability	- Typestation		the terminal should be covered by	Conforms to 4.11 Solder temp: 245±5°C Dipping time: 5±0.5 sec. 1.6mm from the bottom should be dipped.			
Solder heat resistance	Capacitance ESR Current (30 minutes value)	Satisfy initia	al ratings	Conforms to 4.10 Solder temp: 260±10°C Dipping time: 10±1 sec.			
	Appearance	No obvious	abnormality	1.6mm from the bottom should be dipped.			
	Capacitance ESR	Satisfy initia	·	Conforms to 4.12 Temperature condition: -40 °C →Room temperature→			
Temperature cycle	Current (30 minutes value)			1 .	+85 °C →Room temperature		
	Appearance	No obvious	abnormality	Number of cy	ycles : 5 Cycles		
	Capacitance	Within ±20	% of initial value	Conforms to	4.14		
High temp. and high	ESR	Not to exce	ed 120% of initial ratings	Temperature			
humidity resistance	Current (30 minutes value)	Not to exce	ed 120% of initial ratings		nidity: 90 to 95 %RH		
	Appearance	No obvious	abnormality	resting time	: 240±8 hours		
	Capacitance	Within ±30	% of initial value	Conforms to	4.15		
	ESR	Below 2009	6 of initial ratings	Temperature			
High temperature load	Current (30 minutes value)		% of initial ratings		ied: MAX operating voltage ction resistance: 0Ω		
	Appearance		abnormality		: 1000 ⁺⁴⁸ Hours		
Self discharge characteristics		5.5V type: \	/oltage between terminal leads	Charging condition	Voltage applied : 5.0Vdc (Terminal at the case's side be negative) Series resistance : 0Ω Charging time : 24 hours Let stand for 24 hours in condition		
(voltage holding characte	ristics)		Not specified	Storage	described below with terminals opened. Ambient temperature: Lower than 25°C Relative humidity: Lower than 70%RH		



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