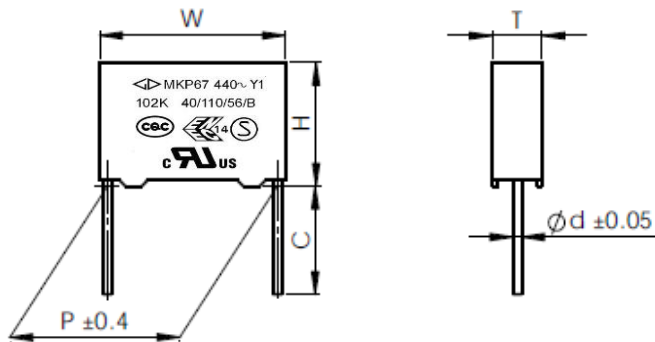


Metallized polypropylene film interference suppression capacitor(Class Y1, 440Vac/500Vac)
Outline Drawing

 $W \pm 0.4, H \pm 0.4, T \pm 0.4$
Features

- Metallized polypropylene structure
- Withstanding overvoltage stressing
- Excellent active and passive flame resistant abilities
- Widely used in line-by-pass, antenna Coupling interference suppression circuit, etc.

Safety Approvals

•		CQC	IEC 60384-14: 2013+AMD1:2016, Y1, 440Vac/500Vac/1500Vdc, 0.00047μF~0.022μF, 40/110/56/B Certificate No.: CQC10001044432
•		ENEC-SEMKO	EN60384-14:2013+A1:2016, Y1, 440Vac/500Vac/1500Vdc, 0.00047μF~0.022μF, 40/110/56/B Certificate No.: SE/0366-4B
•		UL/CUL	UL 60384-14:2016, CSA E60384-14:14, Y1, 440Vac/500Vac/1500Vdc, 0.00047μF~0.022μF, 40/110/56/B File No.: E186600, CCN: FOWX2/8

Specifications

Class	Class Y1	
Climatic Category/Passive Flammability Category	40/110/56/B	
Operating Temperature Range	-40°C ~ +110°C	
Rated Voltage	440Vac/500Vac, 50/60Hz	
Rated DC voltage	1 500Vdc	
Capacitance Range	0.00047μF~0.10μF	
Capacitance Tolerance	±10%(K), ±20%(M)	
Voltage Proof	Between Terminals:	4 000Vac(2s)
	Between Terminals To Case:	4 000Vac(1min)
Insulation Resistance	R≥15 000MΩ (20°C, 100V, 1min)	
Dissipation Factor	≤10×10 ⁻⁴ (1kHz,20°C)	≤20×10 ⁻⁴ (10kHz,20°C)



■ Part number system

The 15 digits part number is formed as follow:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
C	4	7												

Digit 1 to 3 Series code

C47=MKP67

Digit 4 to 5 A.C. rated voltage

S1=440V H2=500V

Digit 6 to 8 Rated capacitance value

For example : 103=10×10³ pF= 0.01μF

Digit 9 Capacitance tolerance

K=±10%, M=±20%

Digit 10 Pitch

6=15.0mm 9=22.5mm B=27.5 mm

Digit 11 Internal use

Digit 12 to 15 Lead form and packaging code

Table 1 Lead form and packaging code

Digit 12		Digit 13		Digit 14		Digit 15	
Code	explanation	Code	explanation	Code	explanation	Code	explanation
A	ammo-pack	4	F=10.0mm F=15.0mm	0	straight	1	each cap. among two consecutive holes P3=12.7mm,H=18.5mm (For pitch=7.5mm) 5 P3=25.4mm;H=18.5mm (For pitch=10/15mm)
		6					
C	straight lead “C” in the figure above	Code	explanation		0	Length tolerance ±0.5mm Or standard length Length tolerance ±0.3mm	
		00	standard lead length (18mm~26mm)		2		
		45	lead length 4.5mm				
		35	lead length 3.5mm				
		32	lead length 3.2mm				
Note: Recommend short lead due to long lead could deform easily.							

■ Dimensions(mm)

440Vac/500Vac #						
C _N	W	H	T	P	d	Part number
470 pF	17.5	11.0	5.0	15.0	0.6	C47S1471-60****
560 pF	17.5	11.0	5.0	15.0	0.6	C47S1561-60****
680 pF	17.5	11.0	5.0	15.0	0.6	C47S1681-60****
820 pF	17.5	11.0	5.0	15.0	0.6	C47S1821-60****
0.0010 μF	17.5	11.0	5.0	15.0	0.6	C47S1102-60****
0.0012 μF	17.5	11.0	5.0	15.0	0.6	C47S1122-60****
0.0015 μF	17.5	11.0	5.0	15.0	0.6	C47S1152-60****
0.0018 μF	17.5	12.0	6.0	15.0	0.6	C47S1182-60****
0.0020 μF	17.5	12.0	6.0	15.0	0.6	C47S1202-60****
0.0022 μF	17.5	12.0	6.0	15.0	0.6	C47S1222-60****
0.0025 μF	17.5	12.0	6.0	15.0	0.6	C47S1252-60****
0.0027 μF	17.5	13.5	7.5	15.0	0.6	C47S1272-60****
0.0028 μF	17.5	13.5	7.5	15.0	0.6	C47S1282-60****
0.0033 μF	17.5	13.5	7.5	15.0	0.6	C47S1332-60****
0.0039 μF	17.5	13.5	7.5	15.0	0.6	C47S1392-60****
0.0040 μF	17.5	13.5	7.5	15.0	0.6	C47S1402-60****
0.0047 μF	17.5	14.0	8.0	15.0	0.6	C47S1472-60****
0.0050 μF	17.5	14.5	8.5	15.0	0.6	C47S1502-60****
0.0056 μF	17.5	14.5	8.5	15.0	0.6	C47S1562-60****
0.0068 μF	17.5	16.0	10.0	15.0	0.8	C47S1682-60****
0.0082 μF	17.5	19.0	11.0	15.0	0.8	C47S1822-60****
0.010 μF	17.5	19.0	11.0	15.0	0.8	C47S1103-60****
0.0056 μF	26.5	15.0	6.0	22.5	0.8	C47S1562-90****
0.0068 μF	26.5	16.0	7.0	22.5	0.8	C47S1682-90****
0.0082 μF	26.5	17.0	8.5	22.5	0.8	C47S1822-90****
0.010 μF	26.5	17.0	8.5	22.5	0.8	C47S1103-90****
0.012 μF	26.5	18.5	10.0	22.5	0.8	C47S1123-90****
0.015 μF	26.5	18.5	10.0	22.5	0.8	C47S1153-90****
0.018 μF	26.5	20.0	11.0	22.5	0.8	C47S1183-90****
0.022 μF	26.5	22.0	12.0	22.5	0.8	C47S1223-90****

- Note: 1. “-”=capacitance tolerance code, M=±20%,K=±10%
 2. “****”=lead form and packaging mode code (refer to table 1)
 3. “#”when the rated voltage is 500Vac,the digit 4~5 is H2.

■ Maximum permissible voltage change per unit of time

Rated Voltage (Vac)	dV/dt(V/us) at 630 Vdc		
	P=15mm	P=22.5mm	P=27.5mm
440	3 000	1 000	500

- Note: 1. Rated voltage pulse slope (dV/dt)_R at rated voltage.
 2. If the working voltage(U) is lower than the rated voltage(U_R),the capacitor can be worked at a higher dV/dt.
 In this case, the maximum allowed dV/dt is obtain by multiplying the right value with U_R/U.

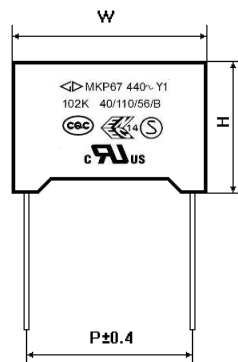
■ Test Method And Performance

No.	Item	Performance	Test Method (IEC 60384-14)
1	4.5 Solderability	Good quality of tinning	Solder temperature: 245°C ±5°C Immersion time: 2.0s±0.5s
2	4.3 Terminal strength (straight lead)	There shall be no visible damage	Tense: 0.50<d≤0.80, 10N Bend: 0.50<d≤0.80, 5N The terminals shall be bent 2 times in each direction
3	4.4 Resistance to solder heat	There shall be no visible damage $\Delta C/C \leq \pm 5\%$ (relative to the initial value)	Solder temperature: 260°C ±5°C Immersion time: 10s ±1s
4	4.20 Solvent resistance of the marking	The marking shall be legible	Solvent: Industrial isopropanol. Solvent temperature: 23°C ±5°C Dipping time: 5min ±0.5min Condition: scrub Scrub material: absorbent cotton Reverting time: No
5	4.2 Initial measurement	Capacitance, Tgδ	
	4.6 Rapid change of temperature	There shall be no evidence of deterioration.	$\theta_A = -40^\circ\text{C}$, $\theta_B = +110^\circ\text{C}$ 5 cycles Duration: t=30min
	4.7 Vibration(straight lead)	There shall be no evidence of deterioration.	Amplitude 0.75mm or acceleration 100m/s ² (whichever is the smaller severity), f: 10Hz to 500Hz. Three directions, 2h for each direction, total 6h.
	4.8 Bump(straight lead)	There shall be no evidence of deterioration.	4 000 times, Acceleration: 400m/s ² , Pulse duration, 6ms
	Final measurement	There shall be no visible damage $\Delta C/C \leq \pm 5\%$ (relative to the initial value)	
6	4.11 Climate sequence	Initial measurement	
		Dry heat	+110°C, 16h
		Damp heat, Cyclic	Test Db, Severity: b, the first cycle
		Cold	-40°C, 2h
		Damp heat, cyclic other	Test Db, Severity b, the other cycles
		Final measurement	There shall be no visible damage, legible marking $\Delta C/C \leq \pm 5\%$ (relative to the initial value) Increase of tgδ: ≤0.008 (10kHz) Dielectric strength : there shall be no permanent breakdown or flashover I.R.: ≥ 50% of the rated value




No.	Item	Performance	Test Method (IEC 60384-14)
7	4.12 Damp heat steady state	There shall be no visible damage, legible marking $\Delta C/C \leq \pm 5\%$ (relative to the initial value) Increase of $\text{tg}\delta$: ≤ 0.008 (10kHz) Dielectric strength : there shall be no permanent breakdown or flashover I.R.: $\geq 50\%$ of the rated value	Temperature: $40^\circ\text{C} \pm 2^\circ\text{C}$ Humidity: $93 \pm 2\%$ RH Duration: 56 days
8	4.13 Impulse voltage	There are three or more waveforms which indicate that no self-heating breakdown have occurred when it is monitored by the monitor	Each individual capacitor shall be subjected to 24 impulses of the same polarity (when any three successive impulses are shown by the monitor to have a wave form indicating that no self-heating breakdown have taken place the impulses can be stopped), the time between impulses shall not be less than 10s, and the peak value of the voltage impulse: 8.0kV
9	4.14 Endurance	There shall be no visible damage, legible marking $\Delta C/C \leq \pm 10\%$ (relative to the initial value) Increase of $\text{tg}\delta$: ≤ 0.008 (10kHz) Dielectric strength : There shall be no breakdown or flashover I.R. : $\geq 50\%$ of the rated value	$+110^\circ\text{C}$, $1.7U_R$ V.a.c. 1 000h The voltage shall be subjected to 1 000Vrms for 0.1s every one hour during test.
10	4.15 Charging and discharging	$\Delta C/C \leq \pm 10\%$ (relative to the initial value) Increase of $\text{tg}\delta$: $C_N \leq 1\mu\text{F}$: ≤ 0.008 (10kHz) I.R.: $\geq 50\%$ of the rated value	Times: 10 000 Duration of charging: 0.5s Duration of discharging: 0.5s Charging voltage: $\sqrt{2} U_R$ V.d.c. Charging resistance: $220/C_N$ (Ω) or the current $\leq 1.0\text{A}$ (whichever is the minor) Discharging resistance: $R = \frac{\sqrt{2} U_R}{C_N \times \frac{dU}{dt}} (\Omega)$ C_N : Capacitance (μF) dU/dt (V/us) : 100V/ μs
11	4.17 Passive flammability	The flaming time of each capacitor shall not go beyond 10s after it is taken apart from the flame. Drop of each capacitor caused by flame shall not fire the tissue below.	Ref.item 4.17 Needle flame test The category of flammability: B Expose time: 1 time Capacitor Volume Exposing time $250 < V(\text{mm}^3) \leq 500$ 20s $500 < V(\text{mm}^3) \leq 1750$ 30s $V(\text{mm}^3) > 1750$ 60s

Quality ensuring test (before shipment):

Inspection item (each batch)	Inspection level (GB/T 2828.1, ISO 2859-1)	
	IL	AQL
Appearance inspection	II	1.5%
Dimensions		
Capacitance	II	0.25%
Tangent of the loss angle		
Dielectric strength		
Insulation resistance		
Solderability	S-3	2.5%

Marking (For example)


Marking Introduction:

Sign	explain	Sign	explain
$\triangleleft \triangleright$	Brand	40/110/56/B	Climate category / Passive Flammability Class
MKP67	Type		CQC Approval
Y1	Class		ENEC-SEMKO Approval
440~	Rated voltage		UL & CUL Approval
102K	Rated capacitance and tolerance		

■ Taping specification for box-type capacitors

▲ Outline Drawing

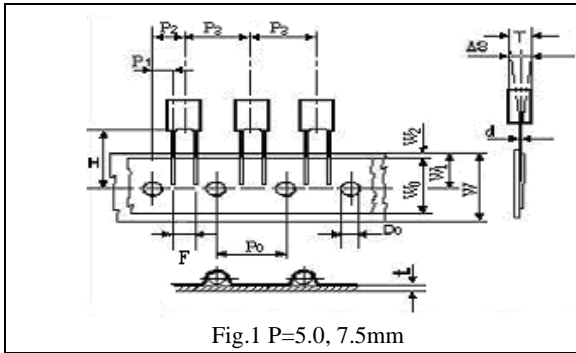


Fig.1 P=5.0, 7.5mm

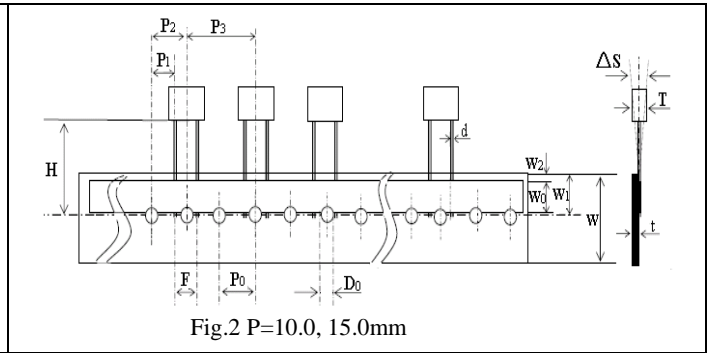


Fig.2 P=10.0, 15.0mm

▲ Taping Dimensions(mm)

Technology index title	Code	Dimensions				Tolerance
		P=5.0	P=7.5	P=10.0	P=15.0	
Taping type	—	Fig 1	Fig 1	Fig2	Fig 2	—
Part number Digit12-15	Ammo-pack	A201	A301	A405	A605	
Taping pitch	P ₃	12.7	12.7	25.4	25.4	±1.0
Feed hole pitch	P ₀	12.7	12.7	12.7	12.7	±0.3
Center of wire	P ₁	3.85	2.6	7.7	5.2	±0.7
Center of body	P ₂	6.35	6.35	12.7	12.7	±1.3
Pitch of taping wire	F**	5.0	7.5	10.0	15.0	+0.6 -0.1
Component alignment	△S	0	0	0	0	±2.0
Height of component from tape center	H***	18.5	18.5	18.5	18.5	±0.5
Carrier tape width	W	18.0	18.0	18.0	18.0	+1.0 -0.5
Hold down tape width	W ₀	6min	10min	10min	10min	—
Hole position	W ₁	9.0	9.0	9.0	9.0	±0.5
Hold down tape position	W ₂	3max	3max	3max	3max	—
Feed hole dia.	D ₀	4.0	4.0	4.0	4.0	±0.2
Tape thickness	t	0.7	0.7	0.7	0.7	±0.2

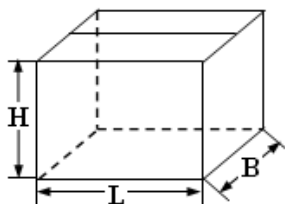
Note: * P₀=15mm is also available;

**F can be other lead spacing;

***H=16.5mm is available;

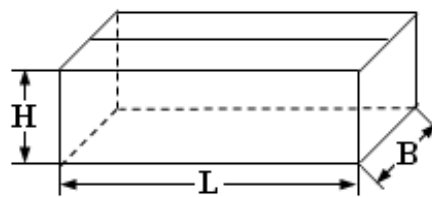
■ Packing box sizes(mm)(example)

1. Out packing box for bulk



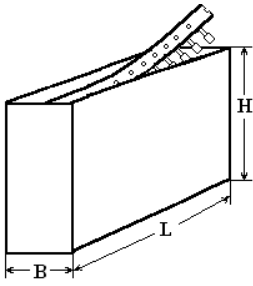
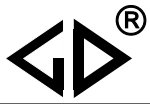
L: 375±5
B: 375±5
H: 265±5

2. Inner packing box for bulk



L: 355±3
B: 175±3
H: 118±3

3. Box sizes for Ammo-pack



L: 350 ± 3
B: 50 ± 3
H: 260 ± 3