

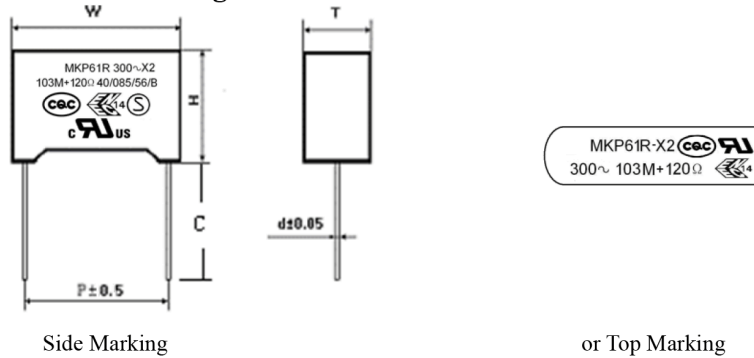


# SPECIFICATION FOR APPROVAL

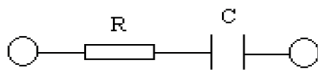
File No.: Q/FRK 0.GS.E.C40-F12

Product Name	Metallized polypropylene film interference suppression RC-unit (Class X2: 300Vac)
Product Type	MKP61R
Type Code	C40
Product Code	
Customer	
Customer Code	
Issue Date	2015-9

SURGE COMPONENTS, INC.  
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**Metallized polypropylene film interference suppression RC-unit (Class X2, 300Vac)**
**■ Outline Drawing**


W±0.4mm, H±0.4mm, T±0.4mm

**■ Electrical Connection**

**■ Features**

- Metallized polypropylene structure
- Withstanding overvoltage stressing
- Excellent active and passive flame resistant abilities
- Excellent active noise suppression, absorbing peak and energy, damp

**■ Safety Approvals**

●		CQC	GB/T 14472-1998, X2, 300Vac, 0.01μF~1.0μF, 10.0Ω~1000.0Ω, 40/085/56/B Certificate No.: CQC03001007467
●		ENEC-SEMKO	EN 60384-14:2013, X2, 300Vac, 0.01μF~1.0μF, 10.0Ω~1000.0Ω, 40/085/56/B Certificate No.: SE/0366-1C, Test Report No.: 1024132
●		UL/CUL	UL60384-14:2014, CSA E60384-14:09, X2, 300Vac, 0.01μ~1.0μF, 10.0Ω~1000.0Ω, 40/085/56/B Certificate No.: E186600, CCN: FOWX2/8

**■ Specifications**

Class	Class X2	
Climatic Category / Passive Flammability Category	40/085/56/B	
Operating Temperature Range	-40°C ~ +85°C	
Rated Voltage	300Vac, 50/60Hz	
Capacitance Range And Tolerance	0.01μF~1.0μF, ±10% (K) ±20% (M)	
Resistance Range And Tolerance	10.0Ω~1000.0Ω, ±30%	R <sub>N</sub> C <sub>N</sub> <50μs, 100kHz R <sub>N</sub> C <sub>N</sub> ≥50μs, 1kHz
Voltage Proof	Between Terminals:	2 000Vdc(2s)
	Between Terminals To Case:	2 100Vac (1min)
Insulation Resistance	R≥15 000MΩ, C <sub>N</sub> ≤0.33μF R <sub>CN</sub> ≥5 000s, C <sub>N</sub> >0.33μF	(20°C, 100V, 1min)

**Part number system**

The 18 digits part number is formed as follow:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
C	4	0															

Digit 1 to 3      Series code

C40=MKP61R

Digit 4 to 5      A.C. rated voltage

Q1=300V

Digit 6 to 8      Rated capacitance value

 For example : 103=10×10<sup>3</sup> pF= 0.01μF

Digit 9            Capacitance tolerance

M=±20%

Digit 10          Pitch

6=14.0mm    7=18.0mm

9=22.5mm    B=27.5mm

Digit 11          Resistor code

Digit 12 to 15    Lead form and packaging code

Digit 16 to 18    Internal use

**Table1 Lead form and packaging code**

Digit 12		Digit 13		Digit 14		Digit 15	
code	explanation	code	explanation	code	explanation	code	explanation
C	straight lead “C” in the figure above	code	explanation			0	Length tolerance ±0.5mm Or standard length
		00	standard lead length (18mm~26mm)				
		45	lead length 4.5mm				
D	Insulated stranded leads	C5	35mm	Note: This length includes the stripping parts.	1	引线长度偏差-5mm~0mm Length tolerance -5 mm~0 mm	
E	Insulated solid leads	K0	100mm		2	引线长度偏差 0 mm~+5 mm Length tolerance 0 mm~+5 mm	
M	Insulated leads and box with mounting foot	K2	120mm		3	引线长度偏差 0 mm~+10mm Length tolerance 0 mm~+10mm	
		L0	200mm		4	引线长度偏差±5 mm Length tolerance ±5 mm	

**■ Dimensions(mm)**

C <sub>N</sub> (μF)	R <sub>N</sub> (Ω)	300Vac					Part number
		W	H	T	P	d	
0.010M	10~470	18.0	14.0	5.0	14.0	0.6	C40Q1103M6#****+++
0.015M	10~470	18.0	14.0	5.0	14.0	0.6	C40Q1153M6#****+++
0.022M	10~470	18.0	14.0	5.0	14.0	0.6	C40Q1223M6#****+++
0.033M	10~470	18.0	14.0	5.0	14.0	0.6	C40Q1333M6#****+++
0.047M	10~470	18.0	14.0	5.0	14.0	0.6	C40Q1473M6#****+++
0.068M	10~470	22.0	14.0	6.0	18.0	0.6	C40Q1683M7#****+++
0.10M	10~470	22.0	14.0	6.0	18.0	0.6	C40Q1104M7#****+++
0.10M	10~470	26.5	16.0	7.0	22.5	0.8	C40Q1104M9#****+++
0.15M	10~220	26.5	16.0	7.0	22.5	0.8	C40Q1154M9#****+++
0.20M	10~220	26.5	16.0	7.0	22.5	0.8	C40Q1204M9#****+++
0.22M	10~220	26.5	16.0	7.0	22.5	0.8	C40Q1224M9#****+++
0.25M	10~220	26.5	17.0	8.5	22.5	0.8	C40Q1254M9#****+++
0.30M	10~120	32.0	18.0	9.0	27.5	0.8	C40Q1304MB#****+++
0.33M	10~120	32.0	18.0	9.0	27.5	0.8	C40Q1334MB#****+++
0.47M	10~120	32.0	20.0	11.0	27.5	0.8	C40Q1474MB#****+++
0.50M	10~100	32.0	20.0	11.0	27.5	0.8	C40Q1504MB#****+++
0.68M	10~47	32.0	22.0	13.0	27.5	0.8	C40Q1684MB#****+++
1.0M	10~27	32.0	22.0	13.0	27.5	0.8	C40Q1105MB#****+++

Note: 1. “\*\*\*\*”=lead form and packaging code (refer to table 1)

2. “#”=Resistor code or internal use, value code of the discharge resistor:

R <sub>N</sub>	10Ω	22Ω	27Ω	47Ω	51Ω	68Ω	100Ω	120Ω	220Ω	470Ω	1000Ω
Code	L	N	P	A	B	S	C	D	E	F	H

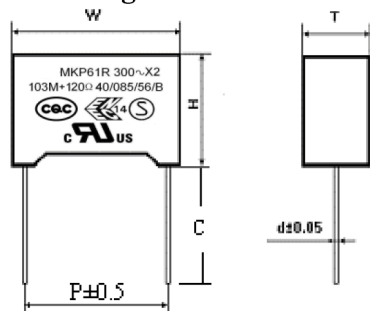
**Test Method And Performance**

No.	Item	Performance	Test Method (GB/T14472, 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	There shall be no visible damage	Tense: 10N Bend: 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.	T <sub>A</sub> = -40°C, T <sub>B</sub> = +85°C 5 cycles Duration: t = 30min
	4.7 Vibration	There shall be no evidence of deterioration.	Amplitude 0.75mm or acceleration 98m/s <sup>2</sup> (whichever is the smaller severity), f: 10Hz to 500Hz. Three directions, 2h for each direction, total 6h.
	4.8 Bump	There shall be no evidence of deterioration.	4 000 times, Acceleration: 400m/s <sup>2</sup> , Pulse duration, 6ms
	Final measurement	There shall be no visible damage $\Delta C/C \leq \pm 5\%$ (relative to the initial value) $\Delta R/R \leq \pm 5\%$ (relative to the initial value)	
6	4.11 Climate sequence	Initial measurement	
		Dry heat	+85°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) $\Delta R/R \leq \pm 5\%$ (relative to the initial value) Dielectric strength : there shall be no permanent breakdown or flashover I.R.: ≥ 50% of the rated value	

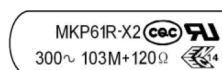
No.	Item	Performance	Test Method (GB/T14472, IEC 60384-14)
7	4.12 Damp heat steady state	There shall be no visible damage, legible marking $\Delta C/C \leq \pm 5\%$ (relative to the initial value) $\Delta R/R \leq \pm 5\%$ (relative to the initial value) Dielectric strength : there shall be no permanent breakdown or flashover I.R.: $\geq 50\%$ of the rated value	Temperature: $40^\circ\text{C} \pm 2^\circ\text{C}$ Humidity: $93 \pm 3\% \text{RH}$ Duration: 56days
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: 2.5kV
9	4.14 Endurance	There shall be no visible damage, legible marking $\Delta C/C \leq \pm 10\%$ (relative to the initial value) $\Delta R/R \leq \pm 10\%$ (relative to the initial value) Dielectric strength : There shall be no breakdown or flashover I.R. : $\geq 50\%$ of the rated value	$+85^\circ\text{C}$ , $1.25U_R \text{V a.c.}$ , 1 000h The voltage shall be subjected to $1000V_{\text{rms}}$ 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) $\Delta R/R \leq \pm 10\%$ (relative to the initial value) I.R.: $\geq 50\%$ of the rated value	Times: 10 000 Duration of charging: 0.5s Duration of discharging: 0.5s Charging voltage: $\sqrt{2} U_R \text{V d.c.}$ Charging resistance: $220/C_R(\Omega)$ 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 ( $\mu\text{F}$ ) $dU/dt$ : 100V/ $\mu\text{s}$
11	4.17 Passive flammability	The flaming time of each capacitor shall not go beyond 30s after it is taken apart from the flame. Drop of each capacitor caused by flame shall not fire the tissue below.	Needle flame test The category of flammability: C Expose time: 1 time Capacitor Volume Exposing time $250 < V(\text{mm}^3) \leq 500$ 10s $500 < V(\text{mm}^3) \leq 1750$ 20s $V(\text{mm}^3) > 1750$ 30s
12	4.18 Active flammability	The cheese cloth around the capacitor shall not burn with a flame.	The specimens shall be individually wrapped in at least 1, but not more than 2, complete layers of cheesecloth, the cheesecloth shall be untreated pure cotton cloth. Each sample shall be subjected to 20 discharged, the interval between successive discharges shall be 5s. $U_i = 2.5kV_0^{+7}\%$ $U_R$ be applied and be maintained for $120_0^{+10}$ s after the last discharge.

**Quality ensuring test (before shipment):**

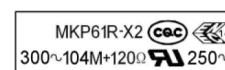
Inspection item (each batch)	Inspection level (GB/T 2828.1,ISO2859-1)	
	IL	AQL
Appearance inspection	II	1.5%
Dimensions		
Capacitance	II	0.25%
Tangent of the loss angle		
Dielectric strength		
Insulation resistance		
Solderability	S-3	2.5%

**Marking**


Side Marking



or



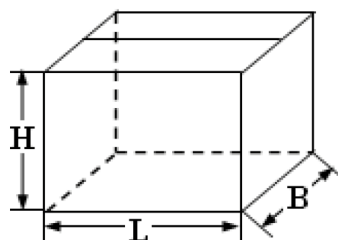
or Top Marking

**Marking Introduction**

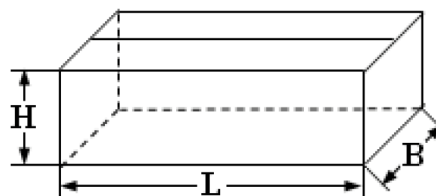
符号	说明	符号	说明
		40/085/56/B	Climate category / Passive Flammability Class
MKP61R	Type		CQC Approval
300~	Rated voltage		ENEC-SEMKO Approval
X2	Class		UL,CUL Approval
103M+120Ω	Rated capacitance and tolerance Resistor	250~	Rated voltage (UL,CUL)

**Packing box sizes(mm)**

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