



SPECIFICATION FOR APPROVAL

File No.: Q/FRK 0.GS.E.C42(T)-C04

Product Name	<u>Box-type Metallized Polypropylene Film Interference Suppression Capacitor for high temperature 125°C (Class X2)</u>
Product Type	<u>MKP62 Series for high temperature 125°C</u>
Type Code	<u>C42(T)</u>
Product Code	<u></u>
Customer	<u></u>
Customer Code	<u></u>
Issue Date	<u>2012-10</u>



Xiamen Faratronic Co. Ltd.

Add: 99, Xinyuan Road, Haicang, Xiamen, China

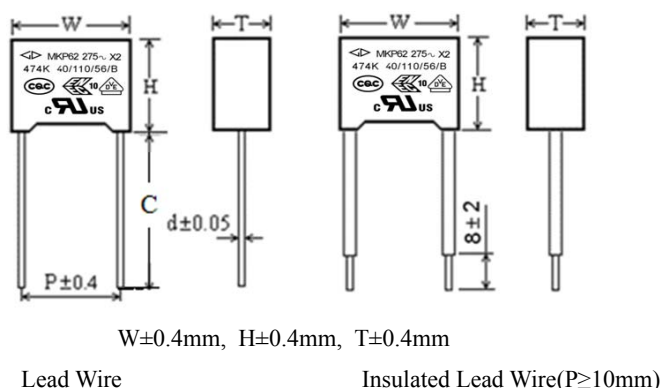
Domestic business
TEL: 0592-6208616 6208620
FAX: 0592-6208777
Mail: csl@faratronic.com.cn
fsc@faratronic.com.cn
Http: www.faratronic.com.cn

Export business
0086-592-6208586 6208608
0086-592-6208556 6208557
james@faratronic.com.cn
jxh@faratronic.com.cn

*.The specification are the property of Xiamen Faratronic Co.Ltd and shall not be copied or used as commercial purposes without permission.

Metallized polypropylene film interference suppression capacitor for high temperature 125°C (Class X2, 275Vac)

■ Outline Drawing



Note: There are two kind of the insulated lead wire:

1. Insulated rigid leads;
2. Insulated flexible leads.

■ Features

- Metallized polypropylene structure
- Withstanding overvoltage stressing
- Excellent active and passive flame resistant abilities
- Widely used in across-the-line, interference suppression circuit, capacitive divider circuit, etc.

■ Safety Approvals

●		CQC	GB/T 14472-1998, X2, 275Vac, 0.0010μF~50.0μF, 40/110/56/B Certificate No.: CQC03001002875
●		ENEC-VDE	EN 60384-14:2005, X2, 275Vac, 0.0010μF~50.0μF, 40/110/56/B Certificate No.: 40000358
●		UL-CUL	UL60384-14:2009, CSA E60384-14:09, X2, 275Vac, 0.0010μF~50.0μF, 40/110/56/B File No.: E186600, CCN: FOWX2/8
●	CB TEST CERTIFICATE		IEC 60384-14:2005, X2, 275Vac, 0.001μF~50.0μF, 40/110/56/B Certificate No.: DE1-49862

■ Specifications

Class	Class X2		
Climatic Category/Passive Flammability Class	40/125/56/B		
Operating Temperature Range	-40°C ~ +125°C		
Rated Voltage (U _R)	275Vac, 50/60Hz		
Maximum continuous DC voltage	560 Vdc		
Capacitance Range	0.0010μF~4.7μF		
Capacitance Tolerance	±10%(K), ±20%(M)		
Voltage Proof	Between Terminals:	2 000Vdc(2s) C _R ≤1.0μF 1 800Vdc(2s) C _R >1.0μF	
	Between Terminals To Case:	2 120Vac (1min)	
Insulation Resistance	R≥15 000MΩ, C _R ≤0.33μF (20°C, 100V,1min) RC≥5 000s, C _R >0.33μF		
Dissipation Factor	0.0010μF≤C _R <0.010μF	≤20×10 ⁻⁴ (1kHz,20°C)	≤20×10 ⁻⁴ (10kHz,20°C)
	0.010μF≤C _R ≤0.47μF	≤10×10 ⁻⁴ (1kHz,20°C)	≤20×10 ⁻⁴ (10kHz,20°C)
	0.47μF<C _R ≤1.0μF	≤20×10 ⁻⁴ (1kHz,20°C)	≤40×10 ⁻⁴ (10kHz,20°C)
	1.0μF<C _R ≤4.7μF	≤30×10 ⁻⁴ (1kHz,20°C)	-----



■ 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	2								T							

Digit 1 to 3 Series code

C42=MKP62

Digit 4 to 5 A.C. rated voltage

P2=275V

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

3=7.5mm 4=10.0mm 6=15.0mm

9=22.5mm B=27.5mm F=37.5mm

Digit 11 Internal use

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
A	ammo-pack	3 4 6	F=7.5mm F=10.0mm F=15.0mm	0	straight	1 5	each cap. among two consecutive holes P3=12.7mm, H=18.5mm(For pitch=7.5mm) P3=25.4mm;H=18.5mm (For pitch=10/15mm) (Detail parameter refer to page 15)
C	straight lead "C" in the figure above	code 00 45	explanation standard lead length (18mm~26mm) lead length 4.5mm			0	Length tolerance ±0.5mm Or standard length
D E	Insulated flexible leads Insulated rigid leads	C5 K0 K2 L0	lead length 35mm lead length 100mm lead length 120mm lead length 200mm			1	Length tolerance -5~0



■ Dimensions(mm)

275Vac							275Vac						
C _R (μF)	W ±0.4	H ±0.4	T ±0.4	P ±0.4	d ±0.05	Part number	C _R (μF)	W ±0.4	H ±0.4	T ±0.4	P ±0.4	d ±0.05	Part number
0.0010	10.5	9.0	4.0	7.5	0.6	C42P2102-3T****+++	0.015	17.5	13.5	7.5	15.0	0.6	C42P2154-6T****+++
0.0012	10.5	9.0	4.0	7.5	0.6	C42P2122-3T****+++	0.015	17.5	12.5	9.0	15.0	0.6	C42P2154-6U****+++
0.0015	10.5	9.0	4.0	7.5	0.6	C42P2152-3T****+++	0.015	17.5	17.5	6.0	15.0	0.6	C42P2154-6V****+++
0.0018	10.5	9.0	4.0	7.5	0.6	C42P2182-3T****+++	0.018	17.5	13.5	7.5	15.0	0.6	C42P2184-6T****+++
0.0022	10.5	9.0	4.0	7.5	0.6	C42P2222-3T****+++	0.22	17.5	14.5	8.5	15.0	0.6	C42P2224-6T****+++
0.0027	10.5	9.0	4.0	7.5	0.6	C42P2272-3T****+++	0.22M	17.5	12.5	9.0	15.0	0.6	C42P2224M6U****+++
0.0033	10.5	9.0	4.0	7.5	0.6	C42P2332-3T****+++	0.22M	17.5	17.5	6.0	15.0	0.6	C42P2224M6V****+++
0.0039	10.5	9.0	4.0	7.5	0.6	C42P2392-3T****+++	0.22K	17.5	18.5	7.5	15.0	0.8	C42P2224K6V****+++
0.0047	10.5	9.0	4.0	7.5	0.6	C42P2472-3T****+++	0.27	17.5	16.0	10.0	15.0	0.8	C42P2274-6T****+++
0.0056	10.5	9.0	4.0	7.5	0.6	C42P2562-3T****+++	0.33	17.5	16.0	10.0	15.0	0.8	C42P2334-6T****+++
0.0068	10.5	9.0	4.0	7.5	0.6	C42P2682-3T****+++	0.33M	18.0	12.0	13.0	15.0	0.8	C42P2334M6U****+++
0.0082	10.5	9.0	4.0	7.5	0.6	C42P2822-3T****+++	0.33M	17.5	18.5	7.5	15.0	0.8	C42P2334M6V****+++
0.010	10.5	9.0	4.0	7.5	0.6	C42P2103-3T****+++	0.39	17.5	19.0	11.0	15.0	0.8	C42P2394-6T****+++
0.012	10.5	9.0	4.0	7.5	0.6	C42P2123-3T****+++	0.47	17.5	19.0	11.0	15.0	0.8	C42P2474-6T****+++
0.015	10.5	9.0	4.0	7.5	0.6	C42P2153-3T****+++	0.15	26.5	15.0	6.0	22.5	0.8	C42P2154-9T****+++
0.018	10.5	9.0	4.0	7.5	0.6	C42P2183-3T****+++	0.18	26.5	15.0	6.0	22.5	0.8	C42P2184-9T****+++
0.022	10.5	9.0	4.0	7.5	0.6	C42P2223-3T****+++	0.22	26.5	15.0	6.0	22.5	0.8	C42P2224-9T****+++
0.027	10.5	11.0	5.0	7.5	0.6	C42P2273-3T****+++	0.27	26.5	16.0	7.0	22.5	0.8	C42P2274-9T****+++
0.033	10.5	11.0	5.0	7.5	0.6	C42P2333-3T****+++	0.33	26.5	16.0	7.0	22.5	0.8	C42P2334-9T****+++
0.039	10.5	12.0	6.0	7.5	0.6	C42P2393-3T****+++	0.39	26.5	17.0	8.5	22.5	0.8	C42P2394-9T****+++
0.047	10.5	12.0	6.0	7.5	0.6	C42P2473-3T****+++	0.47	26.5	17.0	8.5	22.5	0.8	C42P2474-9T****+++
0.010	13.0	9.0	4.0	10.0	0.6	C42P2103-4T****+++	0.56	26.5	18.5	10.0	22.5	0.8	C42P2564-9T****+++
0.012	13.0	9.0	4.0	10.0	0.6	C42P2123-4T****+++	0.68M	26.5	18.5	10.0	22.5	0.8	C42P2684M9T****+++
0.015	13.0	9.0	4.0	10.0	0.6	C42P2153-4T****+++	0.68K	26.5	20.0	11.0	22.5	0.8	C42P2684K9T****+++
0.018	13.0	9.0	4.0	10.0	0.6	C42P2183-4T****+++	0.82	26.5	20.0	11.0	22.5	0.8	C42P2824-9T****+++
0.022	13.0	9.0	4.0	10.0	0.6	C42P2223-4T****+++	1.0	26.5	22.0	12.0	22.5	0.8	C42P2105-9T****+++
0.027	13.0	11.0	5.0	10.0	0.6	C42P2273-4T****+++	1.2	26.5	24.5	15.5	22.5	0.8	C42P2125-9T****+++
0.033	13.0	11.0	5.0	10.0	0.6	C42P2333-4T****+++	1.5	26.5	24.5	15.5	22.5	0.8	C42P2155-9T****+++
0.039	13.0	11.0	5.0	10.0	0.6	C42P2393-4T****+++	0.39	32.0	18.0	9.0	27.5	0.8	C42P2394-BT****+++
0.047	13.0	12.0	6.0	10.0	0.6	C42P2473-4T****+++	0.47	32.0	18.0	9.0	27.5	0.8	C42P2474-BT****+++
0.056	13.0	12.0	6.0	10.0	0.6	C42P2563-4T****+++	0.56	32.0	18.0	9.0	27.5	0.8	C42P2564-BT****+++
0.068	13.0	12.0	6.0	10.0	0.6	C42P2683-4T****+++	0.68	32.0	18.0	9.0	27.5	0.8	C42P2684-BT****+++
0.082	13.0	13.0	7.0	10.0	0.6	C42P2823-4T****+++	0.82	32.0	20.0	11.0	27.5	0.8	C42P2824-BT****+++
0.10	13.0	13.0	7.0	10.0	0.6	C42P2104-4T****+++	1.0	32.0	20.0	11.0	27.5	0.8	C42P2105-BT****+++
0.010	17.5	9.5	5.0	15.0	0.6	C42P2103-6T****+++	1.2	32.0	22.0	13.0	27.5	0.8	C42P2125-BT****+++
0.012	17.5	9.5	5.0	15.0	0.6	C42P2123-6T****+++	1.5M	32.0	22.0	13.0	27.5	0.8	C42P2155MBT****+++
0.015	17.5	9.5	5.0	15.0	0.6	C42P2153-6T****+++	1.5K	32.0	25.0	13.0	27.5	0.8	C42P2155KBT****+++
0.018	17.5	9.5	5.0	15.0	0.6	C42P2183-6T****+++	1.8	32.0	24.5	15.0	27.5	0.8	C42P2185-BT****+++
0.022	17.5	9.5	5.0	15.0	0.6	C42P2223-6T****+++	2.2	32.0	28.0	17.0	27.5	0.8	C42P2225-BT****+++
0.027	17.5	9.5	5.0	15.0	0.6	C42P2273-6T****+++	2.2	32.0	30.0	16.0	27.5	0.8	C42P2225-BU****+++
0.033	17.5	9.5	5.0	15.0	0.6	C42P2333-6T****+++	3.3M	32.0	33.0	18.0	27.5	0.8	C42P2335MBT****+++
0.039	17.5	9.5	5.0	15.0	0.6	C42P2393-6T****+++	3.3K	32.0	37.0	22.0	27.5	0.8	C42P2335KBT****+++
0.047	17.5	9.5	5.0	15.0	0.6	C42P2473-6T****+++	4.7M	32.0	37.0	22.0	27.5	0.8	C42P2475MBT****+++
0.056	17.5	11.0	5.0	15.0	0.6	C42P2563-6T****+++	2.2	41.0	26.0	15.0	37.5	1.0	C42P2225-FU****+++
0.068	17.5	11.0	5.0	15.0	0.6	C42P2683-6T****+++	2.2	42.0	28.0	14.0	37.5	1.0	C42P2225-FT****+++
0.082	17.5	11.0	5.0	15.0	0.6	C42P2823-6T****+++	3.3	41.0	30.0	16.0	37.5	1.0	C42P2335-FT****+++
0.10	17.5	12.0	6.0	15.0	0.6	C42P2104-6T****+++	4.7M	41.0	33.5	18.5	37.5	1.0	C42P2475MFT****+++
0.12	17.5	12.0	6.0	15.0	0.6	C42P2124-6T****+++							

Note: 1. “-”=capacitance tolerance code, M=±20%,K=±10%

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



■ **Maximum permissible voltage change per unit of time**

Rated Voltage (Vac)	Max dV/dt(V/us) at 390Vdc			
	P=10.0mm	P=15.0mm	P=22.5mm	P=27.5mm
275	300	400	200	150

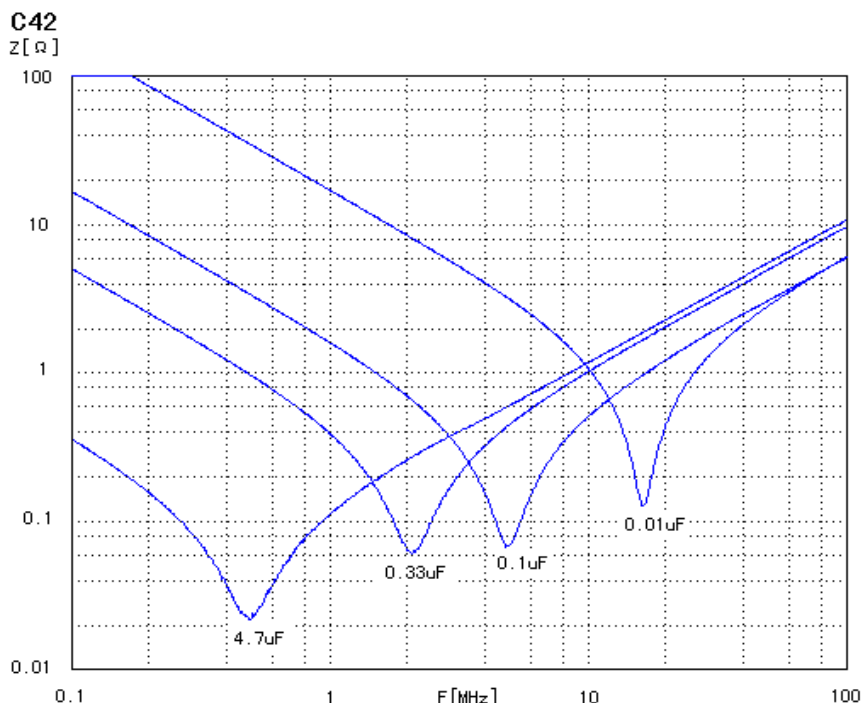
Note:

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 .

■ **Impedance Vs. Frequency**

TYPICAL GRAPHS

Z=f(f) Typical values



■ **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%



■ Test Method And Performance

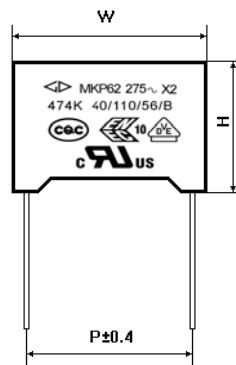
No.	Item	Performance	Test Method (GB/T14472, IEC 60384-14)
1	4.5 Solderability	Good quality of tinning	Solder temperature: 245°C ±5°C Immersion time: 2.0s±0.5s
2	4.3 Terminal strength	There shall be no visible damage	Tense: 0.50<d≤0.80, 10N 0.80<d≤1.25, 20N Bend: 0.50<d≤0.80, 5N 0.80<d≤1.25, 10N The 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 _A =-40°C, T _B =+125°C 5 cycles Duration: t=30min
	4.7 Vibration	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	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	+125°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: C _R ≤1μF: ≤0.008 (10kHz) C _R >1μF: ≤0.005 (1kHz) 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) Increase of $\text{tg}\delta$: $C_R \leq 1\mu\text{F}$: ≤ 0.008 (10kHz) $C_R > 1\mu\text{F}$: ≤ 0.005 (1kHz) 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: 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-healing 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(suitable for $C_R \leq 1\mu\text{F}$; When $C_R > 1\mu\text{F}$, the capacitor can endure pulse voltage value is $2.5 / \sqrt{C_R}$ kV)
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 $\text{tg}\delta$: $C_R \leq 1\mu\text{F}$: ≤ 0.008 (10kHz) $C_R > 1\mu\text{F}$: ≤ 0.005 (1kHz) Dielectric strength : There shall be no breakdown or flashover I.R. : $\geq 50\%$ of the rated value	$+125^\circ\text{C}$, $1.25U_R \text{V a.c.}$, 1 000h The voltage shall be subjected to 1000Vrms 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 $\text{tg}\delta$: $C_R \leq 1\mu\text{F}$: ≤ 0.008 (10kHz) $C_R > 1\mu\text{F}$: ≤ 0.005 (1kHz) 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: $R = \frac{\sqrt{2}U_R}{C_R \times \frac{dU}{dt}} (\Omega)$ C_R : Capacitance (μF) $dU/dt(\text{V}/\mu\text{s})$: 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.	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

No.	Item	Performance	Test Method (GB/T14472, IEC 60384-14)
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 discharges, 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.

■ Marking



Marking Introduction

Sign	explain	Sign	explain
	Brand	40/110/56/B	Climate category / Passive Flammability Class
MKP62	Type		ENEC-VDE Approval
275~	Rated voltage		CQC Approval
X2	Class		UL, CUL Approval
474K	Rated capacitance and tolerance		

■ Taping specification for box-type capacitors

▲ Outline Drawing

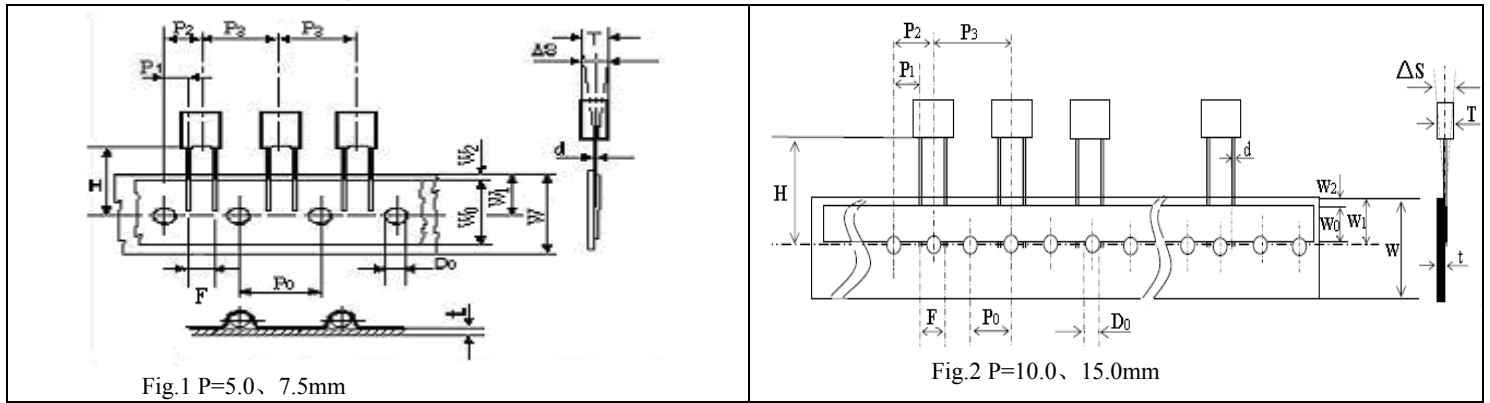


Fig.1 P=5.0、7.5mm

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	± 0.2
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	ΔS	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	0.9	± 0.2

▲ Packing Quantity

Pitch (mm)	Box thickness T(mm)	Ammo-pack (pcs/box)	
		Domestic	Export
5.0	2.5	2500	2 000
	3.5	1 700	1 500
	4.5	1 400	1 300
	5.0	1 200	1 000
	6.0	1 000	800
7.5	3.5	1 700	1 500
	4.0	1 500	1 300
	5.0	1 200	1 000
	6.0	1 000	800
10.0/ 15.0	4.0	750	650
	5.0	600	500
	6.0	500	450
15.0	7.5	400	350
	8.5	350	300
	10.0	300	250
	11.0	250	200

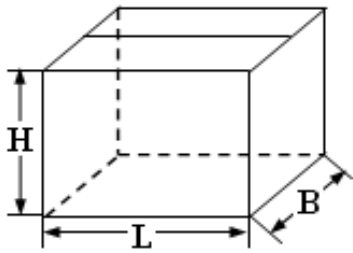
Note: * $P_0=15\text{mm}$ is also available;

**F can be other lead spacing;

***H=16.5mm is available;

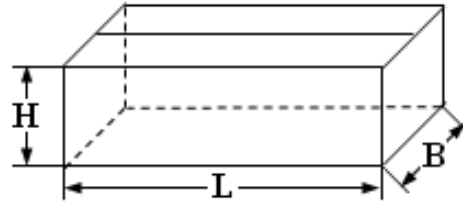
■ Packing box sizes(mm)

1. Out packing box for bulk



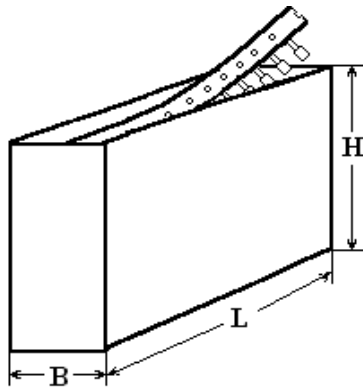
L:375±5
B:375±5
H:265±5

2. Inner packing box for bulk



L:355±3
B:175±3
H:118±3

3. Box sizes for Ammo-pack



L:330±3
B:48±3
H:260±3