



SPECIFICATION FOR APPROVAL

File No.: Q/FRK 0.GS.E.C31-C11

Product Name Metallized polypropylene film capacitor(dipped)

Product Type: CBB21

Product Code C31

Customer _____

Customer Code _____

Issue Date _____

Xiamen Faratronic Co. Ltd.			Approved by Customer
Drafted	Checked	Approved	



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Version history

Current version	Date	Author	Change description

Metallized polypropylene film capacitor(dipped)

■ Outline Drawing

	Forming Lead Shapes			
	I	II	III	IV
	P ≥ F		P < F	
	0mm ≤ P-F ≤ 3mm	3mm < P-F ≤ 8mm	3mm < F-P ≤ 5mm	0mm < F-P ≤ 3mm
F ± 0.8mm; A ≤ 5.0mm; B = 4.5 ± 0.5mm				

■ Features

- Metallized polypropylene structure
- Low loss at high frequency
- Small inherent temperature rise
- Flame retardant epoxy resin powder coating (UL94/V-0)

■ Typical application

- Widely used in high frequency, DC, AC and pulse circuits
- Suitable for S-correction circuits of large screen monitor
- Suitable for the situation where applies high frequency and high current pulse

■ Specifications

Reference Standard	GB/T 10190(IEC 60384-16)				
Climatic Category	40/105/21				
Rated temperature	85°C				
Operating temperature	-40°C~105°C (+85°C to +105°C: decreasing factor 1.25% per °C for U _R)				
Rated Voltage	100V, 250V, 400V, 630V, 1000V, 1250V				
Capacitance Range	0.0010 ~ 3.3μF				
Capacitance Tolerance	±5%(J), ±10%(K), ±20%(M)				
Voltage Proof	1.6U _R (5s)				
Dissipation Factor	≤10 × 10 ⁻⁴ (20°C, 1kHz)				
Insulation Resistance	R ≥ 100 000MΩ, C _N ≤ 0.33μF RC _N ≥ 30 000s, C _N > 0.33μF (20°C, 100V, 1min)				
Maximum Pulse Rise Time(dV/dt) 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.	Pattern II				
	U _R (V)	dV/dt(V/us)			
		P=7.5	P=10.0	P=15.0	P=22.5
	100/250	660	560	310	130
	400	900	780	600	300
630	1 500	1 200	900	400	
1 000/1 250	2 500	2 200	--	--	

■ 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	3	1															

Digit 1 to 3 Series code

C31= CBB21

Digit 4 to 5 D.C. rated voltage

2A=100V 2D=200V 2E=250V 2G=400V

2J=630V 3A=1000V 3B=1250V

Digit 6 to 8 Rated capacitance value

For example: 103=10×10³pF=0.01μF

Digit 9 Capacitance tolerance

J=±5%, K=±10%, M=±20%

Digit 10 Pitch

3=7.5mm 4=10mm 5=12.5mm 6=15mm

8=20mm 9=22.5mm A=25mm C=30mm

Digit 11 Internal use

S= PatternII

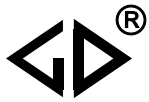
Digit 12 to 15 Lead form and packaging code

Digit 16 to 18 Internal use

Table 1 lead form and packing code

Digit 12		Digit 13		Digit 14		Digit 15	
code	explanation	code	explanation	code	explanation	code	explanation
A	ammo-pack	3	F=7.5mm	1	kinked	A	each cap. between two consecutive holes P3=12.7mm,H=20.0mm (For pitch=7.5mm)
		4	F=10.0mm			E	P3=25.4mm;H=20.0mm (For pitch=10.0/15.0mm)
F	lead kinked	6	F=15.0mm	0	B=4.5mm The length of B	0	B Length tolerance ±0.5mm
		7	F=17.5mm				
		8	F=20.0mm				
		9	F=22.5mm				
Y	straight lead “Y” in the figure above	code	explanation	0		0	Length tolerance ±0.5mm
		45	lead length 4.5mm				
		35	lead length 3.5mm				
		32	lead length 3.2mm				

Digit 12-15 code “C000” means standard lead length (20mm ~ 30mm)



■ Dimensions(mm)

Pattern II (Reduced sizes)

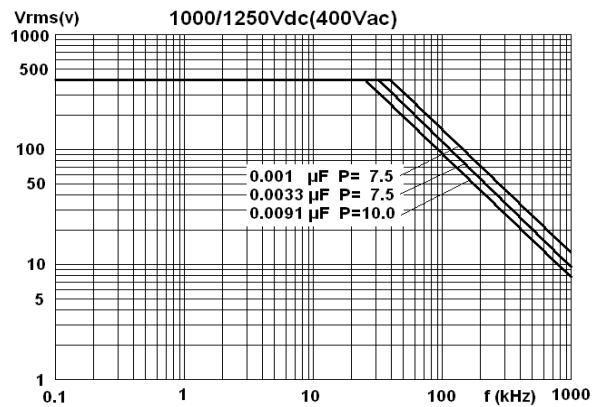
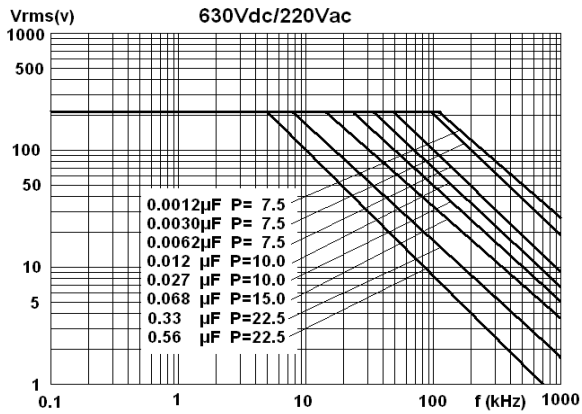
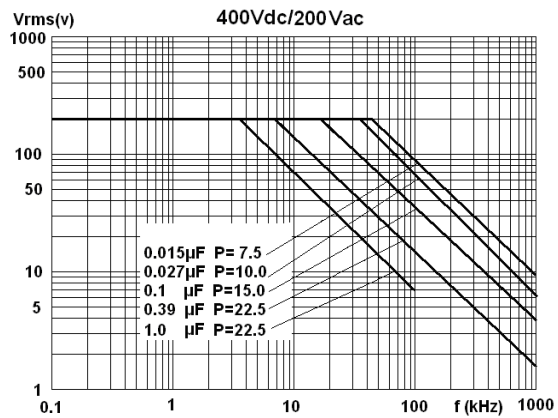
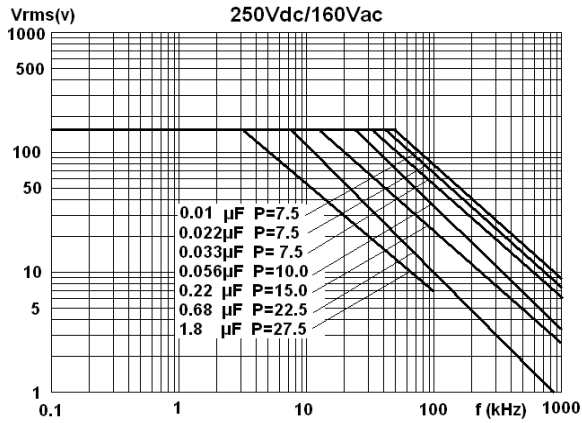
630Vdc(220Vac) [@]							630Vdc(220Vac) [@]							1 000/1 250Vdc [#] (400Vac)						
C _N (μF)	W max	H max	T max	P	d	Part number	C _N (μF)	W max	H max	T max	P	d	Part number	C _N (μF)	W max	H max	T max	P	d	Part number
0.0010	10.0	7.9	4.3	7.5	0.6	C312J102-3S****+++	0.027	12.3	9.4	5.7	10.0	0.6	C312J273-4S****+++	0.0010	10.0	7.9	4.3	7.5	0.6	C313A102-3S****+++
0.0011	10.0	8.1	4.4	7.5	0.6	C312J112-3S****+++	0.030	12.3	9.6	6.0	10.0	0.6	C312J303-4S****+++	0.0011	10.0	8.1	4.4	7.5	0.6	C313A112-3S****+++
0.0012	10.0	8.2	4.5	7.5	0.6	C312J122-3S****+++	0.033	12.3	9.9	6.2	10.0	0.6	C312J333-4S****+++	0.0012	10.0	8.2	4.5	7.5	0.6	C313A122-3S****+++
0.0013	10.0	8.3	4.7	7.5	0.6	C312J132-3S****+++	0.036	12.3	10.1	6.4	10.0	0.6	C312J363-4S****+++	0.0013	10.0	8.3	4.7	7.5	0.6	C313A132-3S****+++
0.0015	10.0	8.1	4.4	7.5	0.6	C312J152-3S****+++	0.039	12.3	10.3	6.7	10.0	0.6	C312J393-4S****+++	0.0015	10.0	8.1	4.4	7.5	0.6	C313A152-3S****+++
0.0016	10.0	8.2	4.5	7.5	0.6	C312J162-3S****+++	0.043	17.5	10.7	5.4	15.0	0.6	C312J433-6S****+++	0.0016	10.0	8.2	4.5	7.5	0.6	C313A162-3S****+++
0.0018	10.0	7.8	4.2	7.5	0.6	C312J182-3S****+++	0.047	17.5	10.8	5.6	15.0	0.6	C312J473-6S****+++	0.0018	10.0	7.8	4.2	7.5	0.6	C313A182-3S****+++
0.0020	10.0	8.0	4.3	7.5	0.6	C312J202-3S****+++	0.051	17.5	11.0	5.8	15.0	0.6	C312J513-6S****+++	0.0020	10.0	8.0	4.3	7.5	0.6	C313A202-3S****+++
0.0022	10.0	8.1	4.5	7.5	0.6	C312J222-3S****+++	0.056	17.5	11.2	6.0	15.0	0.6	C312J563-6S****+++	0.0022	10.0	8.1	4.5	7.5	0.6	C313A222-3S****+++
0.0024	9.8	8.0	4.3	7.5	0.6	C312J242-3S****+++	0.062	17.5	11.4	6.2	15.0	0.6	C312J623-6S****+++	0.0024	10.0	7.7	4.0	7.5	0.6	C313A242-3S****+++
0.0027	9.8	8.1	4.5	7.5	0.6	C312J272-3S****+++	0.068	17.5	11.7	6.5	15.0	0.6	C312J683-6S****+++	0.0027	10.0	7.8	4.2	7.5	0.6	C313A272-3S****+++
0.0030	9.8	8.3	4.7	7.5	0.6	C312J302-3S****+++	0.075	17.5	11.9	6.7	15.0	0.6	C312J753-6S****+++	0.0030	10.0	8.0	4.4	7.5	0.6	C313A302-3S****+++
0.0033	9.8	8.5	4.8	7.5	0.6	C312J332-3S****+++	0.082	17.5	12.2	7.0	15.0	0.6	C312J823-6S****+++	0.0033	10.0	8.2	4.5	7.5	0.6	C313A332-3S****+++
0.0036	9.8	8.0	4.4	7.5	0.6	C312J362-3S****+++	0.091	17.5	12.5	7.3	15.0	0.6	C312J913-6S****+++	0.0036	10.0	8.3	4.7	7.5	0.6	C313A362-3S****+++
0.0039	9.8	8.2	4.5	7.5	0.6	C312J392-3S****+++	0.10	17.5	12.8	7.6	15.0	0.8	C312J104-6S****+++	0.0039	10.0	8.4	4.8	7.5	0.6	C313A392-3S****+++
0.0043	9.8	8.3	4.7	7.5	0.6	C312J432-3S****+++	0.11	17.5	13.6	7.9	15.0	0.8	C312J114-6S****+++	0.0043	10.0	8.2	4.5	7.5	0.6	C313A432-3S****+++
0.0047	9.8	8.5	4.9	7.5	0.6	C312J472-3S****+++	0.12	17.5	13.9	8.2	15.0	0.8	C312J124-6S****+++	0.0047	10.0	8.3	4.7	7.5	0.6	C313A472-3S****+++
0.0051	9.8	8.6	5.0	7.5	0.6	C312J512-3S****+++	0.13	17.5	14.2	8.5	15.0	0.8	C312J134-6S****+++	0.0051	10.0	8.5	4.8	7.5	0.6	C313A512-3S****+++
0.0056	9.8	8.8	5.2	7.5	0.6	C312J562-3S****+++	0.15	17.5	14.7	9.0	15.0	0.8	C312J154-6S****+++	0.0056	10.0	8.7	5.0	7.5	0.6	C313A562-3S****+++
0.0062	9.8	9.0	5.4	7.5	0.6	C312J622-3S****+++	0.16	17.5	15.0	9.3	15.0	0.8	C312J164-6S****+++	0.0062	10.0	8.7	5.0	7.5	0.6	C313A622-3S****+++
0.0068	12.3	8.0	4.4	10.0	0.6	C312J682-4S****+++	0.18	17.5	15.5	9.8	15.0	0.8	C312J184-6S****+++	0.0068	12.0	8.9	5.2	10.0	0.6	C313A682-4S****+++
0.0075	12.3	8.2	4.5	10.0	0.6	C312J752-4S****+++	0.20	17.5	16.0	10.3	15.0	0.8	C312J204-6S****+++	0.0075	12.0	9.1	5.4	10.0	0.6	C313A752-4S****+++
0.0082	12.3	8.3	4.7	10.0	0.6	C312J822-4S****+++	0.22	25.2	15.2	7.9	22.5	0.8	C312J224-9S****+++	0.0082	12.0	9.3	5.6	10.0	0.6	C313A822-4S****+++
0.0091	12.3	8.5	4.9	10.0	0.6	C312J912-4S****+++	0.24	25.2	15.5	8.2	22.5	0.8	C312J244-9S****+++	0.0091	12.0	9.5	5.9	10.0	0.6	C313A912-4S****+++
0.010	12.3	7.8	4.1	10.0	0.6	C312J103-4S****+++	0.27	25.2	15.9	9.2	22.5	0.8	C312J274-9S****+++	0.010	12.0	9.9	6.3	10.0	0.6	C313A103-4S****+++
0.011	12.3	7.9	4.2	10.0	0.6	C312J113-4S****+++	0.30	25.2	16.4	9.6	22.5	0.8	C312J304-9S****+++							
0.012	12.3	8.0	4.4	10.0	0.6	C312J123-4S****+++	0.33	25.2	16.8	10.0	22.5	0.8	C312J334-9S****+++							
0.013	12.3	8.1	4.5	10.0	0.6	C312J133-4S****+++	0.36	25.2	17.2	10.4	22.5	0.8	C312J364-9S****+++							
0.015	12.3	8.3	4.7	10.0	0.6	C312J153-4S****+++	0.39	25.2	17.6	10.8	22.5	0.8	C312J394-9S****+++							
0.016	12.3	8.5	4.8	10.0	0.6	C312J163-4S****+++	0.43	25.2	18.1	11.3	22.5	0.8	C312J434-9S****+++							
0.018	12.3	8.6	4.9	10.0	0.6	C312J183-4S****+++	0.47	25.2	18.6	11.8	22.5	0.8	C312J474-9S****+++							
0.020	12.3	8.8	5.1	10.0	0.6	C312J203-4S****+++	0.51	25.2	19.0	12.2	22.5	0.8	C312J514-9S****+++							
0.022	12.3	8.9	5.3	10.0	0.6	C312J223-4S****+++	0.56	25.2	19.6	12.8	22.5	0.8	C312J564-9S****+++							
0.024	12.3	9.1	5.5	10.0	0.6	C312J243-4S****+++														

Note: 1. “-”=capacitance tolerance code, M=±20%,K=±10%,J=±5%

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

3. “#” when the rated voltage is 1250Vdc,the digit 4~5 is 3B.

4. “@”Not suitable for across-the-line applications. Pls refer to interference Suppression Capacitors.

MAX. VOLTAGE(Vr.m.s) VERSUS FREQUENCY


Note: sinusoidal wave-form, environment temperature $\leq 85^{\circ}\text{C}$, internal temperature rise $\Delta T=10^{\circ}\text{C}$, p (pitch) in mm.

■ Test Method And Performance

No.	Item	Performance	Test method(IEC 60384-16)
1	Solderability	Good quality of tinning	Solder temperature:245°C±5°C Immersion time: 2.0s±0.5s
2	Initial measurement	Capacitance Tgδ:1kHz, C>1.0μF 10kHz, C≤1.0μF	
	Terminal strength	There shall be no visible damage	Tension: 0.6≤φd≤0.8mm, 10N φd=1.0mm, 20N Bend: 0.6≤φd≤0.8mm, 5N φd=1.0mm, 10N The terminals shall be bent 2 times in each direction.
	Resistance to solder heat	There shall be no visible damage	Solder temperature:260°C±5°C Immersion time: 10s±1s
	Final measurement	ΔC/C ≤±3%(relative to the initial value) Increase of tgδ: ≤0.004 (10kHz,C≤1.0μF) ≤0.004 (1kHz,C>1.0μF)	
3	Initial measurement	Capacitance Tgδ:1kHz, C>1.0μF 10kHz, C≤1.0μF	
	Rapid change of temperature	There shall be no evidence of deterioration.	θ _A =-40°C, θ _B =+105°C 5 cycles, Duration: t=30min
3	Vibration	There shall be no evidence of deterioration.	Amplitude 0.75mm or acceleration 98m/s ² (whichever is the smaller severity), f: 10Hz to 500Hz.Three directions, 2h for each direction, total 6h.
	Bump	There shall be no evidence of deterioration.	4 000 times, Acceleration: 390m/s ² ,Pulse duration, 6ms
	Final measurement	ΔC/C≤±3%(relative to the initial value) Increase of tgδ: ≤0.004 (10kHz, C≤1.0μF) ≤0.004 (1kHz, C>1.0μF) IR: ≥ 50% of the rated value	
4	climate sequence	Initial measurement	Capacitance Tgδ:1kHz, C>1.0μF 10kHz, C≤1.0μF
		Dry heat	+105°C, 16h
		Damp heat, Cyclic	Test Db, Severity: b, the first cycle
		Cold	-40°C, 2h
		Low air pressure	There shall be no permanent breakdown, flashover or other harmful deformation when applying U _R at the last 1 minute.
			15°C~ 35°C, 8.5kPa, 1h,

No.	Item		Performance	Test method(IEC 60384-16)
4	climate sequence (continue)	Damp heat, cyclic other		Test Db, Severity b, the other cycles, Applying U_R for 1 minute after the test finished.
		Final measurement	There shall be no evidence of deterioration and the marking shall be legible. $\Delta C/C \leq \pm 5\%$ (relative to the initial value) Increase of $\text{tg}\delta$: ≤ 0.005 (10kHz, $C \leq 1.0\mu\text{F}$) ≤ 0.005 (1kHz, $C > 1.0\mu\text{F}$) IR: $\geq 50\%$ of the rated value	
5	Damp heat steady state		There shall be no evidence of deterioration and the marking shall be legible. $\Delta C/C \leq \pm 5\%$ (relative to the initial value) Increase of $\text{tg}\delta \leq 0.002$ IR: $\geq 50\%$ of the rated value	Temperature: $40^\circ\text{C} \pm 2^\circ\text{C}$ Humidity: $93 \pm 3\%$ RH Duration: 21 days
6	Endurance		$\Delta C/C \leq \pm 5\%$ (relative to the initial value) Increase of $\text{tg}\delta$: ≤ 0.004 (10kHz, $C \leq 1.0\mu\text{F}$) ≤ 0.004 (1kHz, $C > 1.0\mu\text{F}$) IR: $\geq 50\%$ of the rated value	Temperature: $+85^\circ\text{C}$ Voltage: $1.25 \times U_R$ (50Hz) Duration: 1 000h
7	Temperature characteristic		Measuring capacitance at test point b, d, f: Characteristic at lower category temperature -40°C : $0 \leq (C_b - C_d)/C_d \leq +3\%$ Characteristic at upper category temperature $+85^\circ\text{C}$: $-3.25\% \leq (C_f - C_d)/C_d \leq 0$	Static method: The capacitors should be kept at the following temperature in turn: a. $(+20 \pm 2)^\circ\text{C}$ b. $(-40 \pm 2)^\circ\text{C}$ d. $(20 \pm 2)^\circ\text{C}$ f. $(+85 \pm 2)^\circ\text{C}$ g. $(+20 \pm 2)^\circ\text{C}$
8	Charging and discharging		$\Delta C/C \leq \pm 5\%$ (relative to the initial value) Increase of $\text{tg}\delta$: ≤ 0.005 (10kHz, $C \leq 1.0\mu\text{F}$) ≤ 0.005 (1kHz, $C > 1.0\mu\text{F}$) IR: $\geq 50\%$ of the rated value	Times: 10 000 Duration of charging: 0.5s Duration of discharging: 0.5s Charging voltage: rated voltage Charging resistance: $220/C_R(\Omega)$ Discharging resistance: $R = 10/C_R(\Omega)$ or 20Ω (whichever is the greater) C_R : rated capacitance (μF)

Quality ensuring test (before shipment):

Inspection item (each batch)	Inspection level (GB 2828)	
	IL	AQL
Appearance inspection	S-4	1.5%
Dimensions		
Capacitance	II	0.65%
Tangent of the loss angle		
Dielectric strength		
Insulation resistance		
Solderability	S-3	2.5%

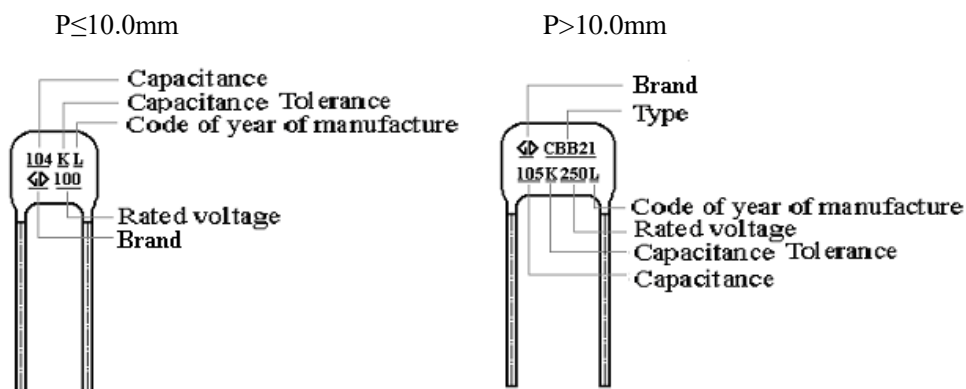
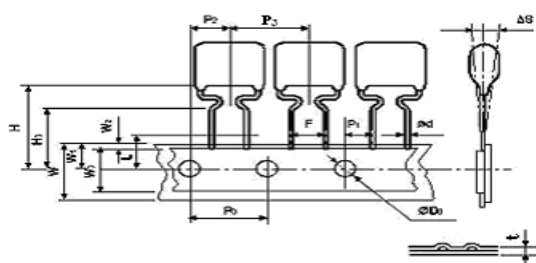
■ Marking

■ Taping for dipped-type capacitor
▲ Outline Drawing


Fig.1

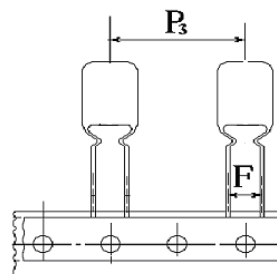


Fig 2

▲ Taping Dimensions(mm)

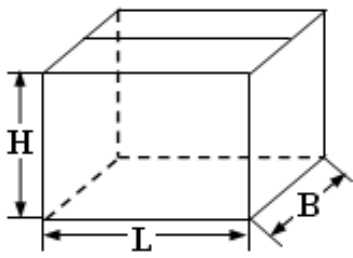
Technology index title	Code	Dimensions (mm)				Tolerance
		P=5.0	P=7.5	P=10.0	P=15.0	
Taping type	—	Fig 1	Fig 1	Fig 2	Fig 2	—
Part number Digit 12-15	Ammo-pack	A21A	A31A	A41E	A61E	
Taping pitch	P ₃	12.7	12.7	25.4	25.4	±1.0
Feed hole pitch	P ₀	12.7	12.7	12.7	12.7	±0.3
Center of wire	P ₁	3.85	2.60	7.7	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	+0.8 -0.2
Component alignment	ΔS	0	0	0	0	±2.0
Height of crangle from tape center	H	20.0	20.0	20.0	20.0	±1.0
Height of component from tape center	H ₀	16.0	16.0	16.0	16.0	±0.5
Carrier tape width	W	18.0	18.0	18.0	18.0	+1.0 -0.5
Hold down tape width	W ₀	10min	10min	10min	10min	—
Hole position	W ₁	9.0	9.0	9.0	9.0	+0.75 -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	±0.3
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;

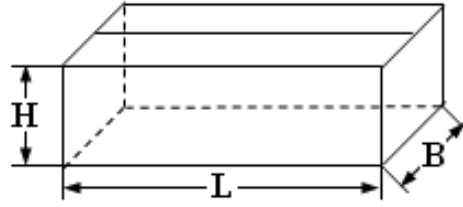
■ Packing box sizes(mm)

1. Out packing box for bulk



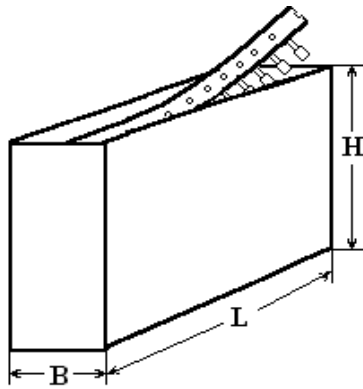
L:375±5
B:375±5
H:265±5

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

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