

Part Number System (产品编码)

1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21	
SERIES		CAPCITANCE		TOL.		VOLTAGE		CASE SIZE		TYPE		SLEEVE		COLOR		SHAPE		OTHERS																							
Series	Cap (MFD)	Code	Tolerance	Code	Voltage	Code	Case Size		Feature Code		Background	Code	Special	Code																											
							Liameten	Code																																	
LG	LR	0.1	104	±5%	J	004	4	3	B	Bulk	RRO	Black	H	No special	PO																										
ER	PG	0.22	224	±10%	K	6R3	6.3	4	C	PCB Termial		Green	L	Other trademark	WO																										
BR	VG	0.33	334	±15%	L	008	8	5	D	Ammo Taping		Violet	Z	Ø8 F=2.5mm	X0																										
VT	VZ	0.47	474	±20%	M	010	10	6.3	E	2.0mm Pitch	T20	Light purple																													
SM	SX	1	105	±30%	N	016	16	8	F	2.5mm Pitch	T25	Navy blue	S																												
KS	KF	2.2	225	-40%	W	025	25	10	G	3.5mm Pitch	T35	Sky blue	T	Finite height	GO																										
GM	KM	3.3	335	0		035	35	13	J	5.0mm Pitch	T50	Coffee	K	Special voltage	VX																										
GS	EF	4.7	475	-20%	A	050	50	16	K	Lead Cut & Form		Orange red		Special capacitance	CX																										
ZF	GR	10	106	0		063	63	18	L	C-Type	CXX	Transparent blue	M																												
LF	GF	22	226	-20%	C	080	80	22	N	E-Type	EXX	Transparent yellow	Y																												
EL	AL	33	336	10%		100	100	25	O	V-Type	VXX	Printing color																													
KL	HL	47	476	-20%	X	120	120	30	P	Q-Type	QXX	Black	1																												
FL	GL	100	107	40%		160	160	35	Q	P-Type	PXX	White	2																												
ML	ZL	220	227	-10%	V	200	200	40	R	W-Type	WXX	Silvery	3																												
PL	RL	330	337	申友莲		220	220	51	S	K-Type	KXX	Golden	4																												
LM	LK	470	477	0	R	250	250	63.5	T	H-Type	HXX																														
LH	LL	2200	228	20%		315	315	76	U	Y-Type	YXX																														
NM	NS	22000	229	0	I	350	350	90	X																																
NP	NH	33000	339	50%		400	400	Len. (mm)	Code																																
BP	PZ	47000	479			420	420	05	5																																
MZ	FZ	100000	10T			450	450	07	7	Sleeve Material	Code																														
LZ	PF	150000	15T			500	500	09	9	PET	E	Rubber Shape	Code																												
AP	PE	220000	22T			550	550	10	10	PVC	V	Plane	F																												
LS	LP	330000	33T			600	600	11	11			Convex	T																												
FP	PN	1000000	10M					12	12			Snap-in	S																												
MN	FN	2200000	22M					13	13			V-chip	V																												
UN		3300000	33M					14	14																																
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								45	45																																
								50	50																																
								55	55																																
								60	60																																

KS Series

7mmL(高), -40°C+105°C

FEATURES

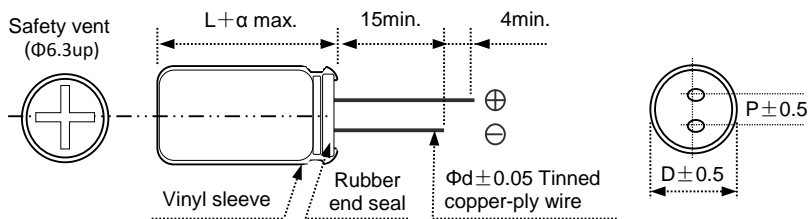
1. Rated working voltage range 6.3 to 50V DC operation temperature range -40 to +105°C.

2. This series is for communication equipments ,switching power supply ,industrial measuring instruments ,automotive electric products ,etc .

SPECIFICATIONS

Item	Performance Characteristics							
Operation Temperature Range	-40 to +105°C							
Rated Working Voltage Range	6.3 to 50V							
Nominal Capacitance Range	0.1 to 220μF							
Capacitance Tolerance	±20%(120Hz,+20°C)							
Leakage Current	L≤0.01CV or 3(μA)							
	Whichever is greater measured after 2 minutes application of rated working voltage at +20 C							
tan δ(120Hz,+20°C)	Working Voltage(v)	6.3	10	16	25	35	50	
	tan δ(max)	0.24	0.21	0.18	0.15	0.13	0.12	
Low Temperature Characteristics	Impedance ratio max. at 120 HZ							
	Working Voltage(V)	6.3	10	16	25	35	50	
	Z-25°C/Z+20°C	4	2	2	2	2	2	
	Z-40°C/Z+20°C	8	6	4	3	3	3	
High Temperature Loading	Test conditions Duration : 1000 hours Ambient temp : +105°C Applied voltage : Rated DC working voltage with rated ripple current				Post test requirements at +20°C Leakage current: ≤Initial specified value Cap. Change : within±20% of initial measured value Tan δ : ≤200% of initial specified value			
	Shelf Life	Test conditions Duration : 1000 hours Ambient temp : +105°C Applied voltage : (None)				Post test requirements at +20°C Same limits for high temperature loading.		
Other								
JIS C-5101 (IEC 60384)								

CASE SIZE TABLE



ΦD	4	5	6.3	8
F	1.5	2	2.5	3.5
Φd	0.45			0.45
α	(L≤7) 1		(L≤9) 1.5	
β	0.5			

RIPPLE CURRENT MULTIPLIER

Frequency Coefficient

Cap(μF)	50 Hz	120Hz	300Hz	1KHz	10KHz~
≤47	0.75	1.0	1.35	1.57	2.0
68-330	0.8	1.0	1.23	1.34	1.5

电解电容器检查表

TEST REPORT FOR ELEC CAPACITORS

客户料号: C43840

系列 Series	KS	规格 Specification	22uF25v	尺寸 Size	4*7	数量 QTY.	0pcs
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1、测试仪器: LCR METER 测试仪、漏电流测试仪

2、产品尺寸图示:

	项目	单位 (mm)
	直径 D	4
	高度 L	7
	脚距 F	1.5
	CP线直径 d	0.45±0.05
	α	1.0
	β	0.5

3、样品特性测试数据如下表:

[测试温度: 20 °C、湿度: 60 %]

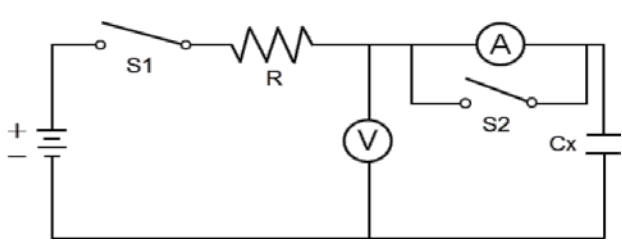
NO.	Cap 静电容量(120Hz)	D.F 损失角	L.C.漏电流	E.S.R 串联等效阻抗 or Z值
	Tolerance: <u>-20~+20</u> % 17.6 ~ 26.4 (uF)	<u>120</u> Hz ≤ 0.15	<u>25</u> V <u>2</u> 分钟 ≤ 5.5 (uA)	<u>100k</u> Hz ≤ (Ω)
1	22.5	0.077	5.1	
2	22.1	0.072	3.9	
3	22.7	0.087	4.2	
4	22.9	0.084	4.6	
5	22.4	0.078	5.3	
6	22.4	0.091	5.0	
7	22.7	0.082	3.8	
8	22.5	0.077	3.3	
9	22.8	0.073	5.4	
10	22.2	0.078	3.6	
Max.	22.9	0.091	5.4	
Min.	22.1	0.072	3.3	
平均值	22.5	0.080	4.4	
判定 Decision	PASS	PASS	PASS	

1. Scope 适用范围:

This specification applies to aluminum electrolytic capacitor , used in electronic equipment .

本说明适用于用电子仪器设备进行检测之铝电解电容器.

2. Electrical characteristics 电气特性:

NO.	ITEM 项目	TEST METHOD 测试方法	SPECIFICATION 规格															
2.1	Rated voltage 额定电压		Voltage range 、Capacitance range, see specification of this series. 电压、容量范围请看该系列之规格说明.															
2.2	Capacitance 静电容量	1.Measuring frequency 测试频率 2.Measuring voltage : $\leq 0.5V_{rms} + 0.5 \sim 2.0V_{DC}$ 测试电压																
2.3	Dissipation factor 散逸因素 (损失角)	3.Measurement circuit : 测试电路																
2.4	Leakage current 泄漏电流	<p>DC Leakage current shall be measured after 1~2 minutes application of the DC rated working voltage through the 1000 Ω resistor at 20$^{\circ}C$. 在20$^{\circ}C$通过1000Ω的电阻施加直流工作电压1~2分钟后测定直流泄漏电流.</p>  <p>R : 1000 \pm 100Ω S1 : Switch 开关 A : DC Current meter S2 : Switch for protect of 直流电流计 直流电流计的保护开关 V : DC Voltage meter 直流电压计 CX : Testing Capacitor 测试电容</p>	Dissipation factor 、Leakage current, see specification of this series. 损失角、泄漏电流请看该系列之规格说明.															
2.5	Temperature characteristics 高低温特性	<table border="1"> <thead> <tr> <th>STEP 步骤</th> <th>TEMPERATURE 温度($^{\circ}C$)</th> <th>STORAGE TIME 放置时间(min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>20 \pm 2</td> <td>30</td> </tr> <tr> <td>2</td> <td>下限温度(0/-3)</td> <td>120</td> </tr> <tr> <td>3</td> <td>20 \pm 2</td> <td>15</td> </tr> <tr> <td>4</td> <td>上限温度 \pm 2</td> <td>120</td> </tr> </tbody> </table> <p>Step 1. Measure the capacitance and impedance. 测试静电容量及阻抗($Z_{20^{\circ}C}$) . (Z , 120Hz \pm 10%)</p> <p>Step 2. Measure the impedance at thermal balance after 2 hours. 达到热平衡2小时后测试阻抗(Z_r) . (Z , 120Hz \pm 10%)</p> <p>Step 4. Measure the capacitance and leakage current at thermal balance after 2 hours. 达到热平衡2小时后测试静电容量及漏电流 .</p>	STEP 步骤	TEMPERATURE 温度($^{\circ}C$)	STORAGE TIME 放置时间(min)	1	20 \pm 2	30	2	下限温度(0/-3)	120	3	20 \pm 2	15	4	上限温度 \pm 2	120	<p>Step 2. Impedance ratio ($Z_r/Z_{20^{\circ}C}$) less than specified value. 阻抗比 : 低于规定值 .</p> <p>Step 4 Capacitance change : within \pm 20% of the initial measured value. 容量变化 : 初测值的\pm 20%以内. Leakage current : Less than 10 times of specified value. 泄漏电漏: 规格值的10倍以下 .</p>
STEP 步骤	TEMPERATURE 温度($^{\circ}C$)	STORAGE TIME 放置时间(min)																
1	20 \pm 2	30																
2	下限温度(0/-3)	120																
3	20 \pm 2	15																
4	上限温度 \pm 2	120																

No.	ITEM 项目	TEST METHOD 测试方法	SPECIFICATION 规格
2.6	Surge test 浪涌(突波)试验	Rated surge voltage shall be applied (swich on) for 30±5 seconds and then shall be applied (swich off) with discharge for 5±0.5 min at room temperature .This cycle shall be repeated for 1000 cycles .Duration of one cycle is 6±0.5 minutes . 在常温下施加(合上开关)额定涌浪电压30±5秒,然后停止施加 (断开开关)涌浪电压并且放电5±0.5分钟.这个循环要重复1000次.以 6±0.5分钟为一个循环周期.	Capacitance change : Within ± 20% of the initial measured value. 容量变化: 初测值的 ±20%以内. Dissipation factor: Lessthan 200% of the specified value. 损失角:规定值的200%. Leakage current: Less than specified value. 泄漏電流:规定值以内.
2.7	MAXIMUM APPLICABLE RIPPLE CURRENT 高温纹波负荷试验	The maximum A.C.current having frequency of 120Hz (or 100KHz) which can be applied to the capacitor at Max. temperature ±2℃ continuously.Peark voltage not to exceed rated D.C.voltage. 在120Hz(or 100KHz)频率条件下,以电容器最高使用温度下,施加最大的允许纹波电流.施加的AC及DC偏压不能超过DC电压.	

3.Mechanical characteristics 机械特性:

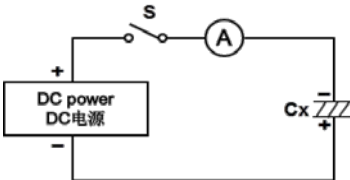
No.	ITEM 项目	TEST METHOD 测试方法	SPECIFICATION 规格																				
3.1	Lead strength 端子强度	<p>(A).Tensile strength 拉伸强度:</p> <p>1).wire lead terminal 导针型 :</p> <table border="1"> <tr> <td>d(mm)</td> <td>0.35<d≤0.5</td> <td>0.5<d≤0.8</td> <td>0.8<d≤1.25</td> </tr> <tr> <td>Load (Kgf)</td> <td>0.51</td> <td>1.0</td> <td>2.0</td> </tr> </table> <p>2).snap-in terminal 尖脚型 :</p> <table border="1"> <tr> <td>d (mm)</td> <td>snap-in terminal 尖脚端子</td> </tr> <tr> <td>load (Kg)</td> <td>2.0</td> </tr> </table> <p>The capacitor terminals to bear the load 10 seconds of the above-mentioned provisions, there can be no electrical or mechanical properties on the damage. 电容器各端子要承受上表规定的荷重10秒,不能有电气或机械特性上的损伤.</p> <p>(B).Bending strength 弯曲强度: wire lead terminal 导针型 :</p> <table border="1"> <tr> <td>d(mm)</td> <td>0.35<d≤0.5</td> <td>0.5<d≤0.8</td> <td>0.8<d≤1.25</td> </tr> <tr> <td>Load (Kgf)</td> <td>0.25</td> <td>0.51</td> <td>1.0</td> </tr> </table> <p>Will test capacitance vertical fixed, applying the above-mentioned provisions to each terminal axial load, slowly turn capacitor by the vertical position to horizontal position, then rotate 180 ° in the opposite direction, back to the initial vertical position (about 5 s) the whole process.The capacitor performance cannot change and loss of the terminal can't have. 将测试电容垂直固定,给每一端子轴向施加上表规定荷重后,慢慢将电容器由竖直位置转至水平位置,然后反方向旋转180°后,再回到初始的垂直位置(整个过程约5S). 电容器性能不能有变化及端子不能有损伤.</p>	d(mm)	0.35<d≤0.5	0.5<d≤0.8	0.8<d≤1.25	Load (Kgf)	0.51	1.0	2.0	d (mm)	snap-in terminal 尖脚端子	load (Kg)	2.0	d(mm)	0.35<d≤0.5	0.5<d≤0.8	0.8<d≤1.25	Load (Kgf)	0.25	0.51	1.0	<p>When the capacitance is measured, there shall be no intermittent contacts,or open or short circuiting. 测试静电容量时,不能有接触不良,开路或短路。</p> <p>There shall be no such mechanical damage as terminal damage etc. 不能有如端子受损之类的机械特性上的损伤。</p>
d(mm)	0.35<d≤0.5	0.5<d≤0.8	0.8<d≤1.25																				
Load (Kgf)	0.51	1.0	2.0																				
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Load (Kgf)	0.25	0.51	1.0																				

No.	ITEM 项目	TEST METHOD 测试方法	SPECIFICATION 规格
3.2	Vibration resistance 振动	Vibration frequency to evenly, cover a wide range of 10 Hz ~ 55 Hz, amplitude is 1.5 mm, in 1 minute to complete the cycle. The capacitor by terminal firmly fixed. The capacitors should be in three mutually perpendicular direction vibration, vibration for 2 hours in each direction. 振动频率要均匀,范围为10Hz~55 Hz,振幅为1.5mm,在1 分钟内完成该循环. 电容器由端子牢固地固定. 电容器应在三个互相垂直的方向振动,每个方向振动 2 小时 .	Capacitance :no unsteady. 静电容量:稳定. Appearance: no abnormal. 外观:无异常 . Capacitance change : Within $\pm 5\%$ of the initial measured value. 容量变化:初测值的 $\pm 5\%$ 以内. Dissipation factor: Within initial specified value. 损失角:规定值以内. Leakage current: Within initial specified value. 泄漏电流:规定值以内.
3.3	Solderability 可焊性	The leads are dipped in the solder bath of Sn at 245 ± 5 °C for 3 ± 0.5 seconds . The dipping depth should be set at 1.5 ~ 2.0 mm. 端子浸没在 245 ± 5 °C的锡焊液中 3 ± 0.5 秒,浸没深度设定为1.5~2.0mm .	The solder alloy shall cover the 95% or more of the dipped lead's area . 锡液要覆盖导针浸入表面积的95%以上 .

4.Reliability 信赖性:

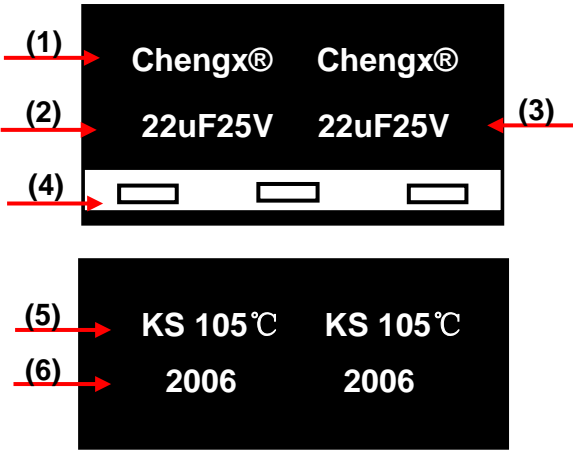
No.	ITEM 项目	TEST METHOD 测试方法	SPECIFICATION 规格
4.1	Soldering heat resistance 耐焊接热	The leads immerse in the solder bath of Sn at 260 ± 5 °C for 10 ± 1 seconds until a distance of 1.5 ~ 2mm from the case . 导针在 260 ± 5 °C 的锡 焊液中浸没至离本体 1.5 ~ 2 mm 的地方 10 ± 1 秒钟 .	No damage or leakage of electrolyte. 无损伤或电解液漏出. Capacitance change : Within $\pm 5\%$ of the initial measured value. 容量变化:初测值的 $\pm 5\%$ 以内. Dissipation factor: Less than specified value. 损失角:规定值以内. Leakage current: Less than specified value. 泄漏电流:规定值以内.
4.2	Damp heat (steady state) 稳态湿热	Subject the capacitors to 40 ± 2 °C and 90% to 95% relative humidity for 500+24/0 hours 电容器在 40 ± 2 °C及相对湿度90%到95%的条件下贮存500(-0~+24)小时.	Capacitance change : Within $\pm 10\%$ of the initial measured value. 容量变化:初测值的 $\pm 10\%$ 以内. Dissipation factor: Less than 120% of thel specified value. 损失角:规定值120%以内. Leakage current: Less than specified value. 泄漏电流:规定值以内.

NO.	ITEM 项目	TEST METHOD 测试方法	SPECIFICATION 规格
4.3	Load life 高温负荷	<p>After X hours continuous application of DC rated working voltage at Max. temperature $\pm 5^{\circ}\text{C}$. Measurements shall be performed after 2 hours exposed at room temperature . 在最高使用温度$\pm 5^{\circ}\text{C}$环境下,连续施加额定的DC工作电压 X 小时. 室温暴露2小时后进行测试.</p> <p>(X:see specification of this series.见该系列规格说明.)</p>	<p>Standard of judgement is according to requirement of this series. 判定标准依该系列要求 .</p>
4.4	Shelf life 高温储存	<p>After storage for Y hours at temperature $\pm 5^{\circ}\text{C}$ (See specification of this series) without voltage application, the measurements shall meet the following limits . Measurements shall be performed after exposed for 1 to 2 hrs at room temperature after application of DC rated voltage to the capacitor for Z minutes . 在目录书规定的温度环境中,不施加电压放置 Y 小时后按以下条件测试. 室温暴露1~2 小时后,施加DC额定电压 Z 分钟后进行。</p> <p>(Y,Z :See specification of this series.见该系列规格说明)</p>	
4.5	Storage at low temperature 低温储存	<p>The capacitor shall be stored at the lowest($\pm 3^{\circ}\text{C}$) temperature for 16 hours ,during which time no voltage shall be applied.And then the capacitor shall be subjected to standard atmospheric conditions for 16 hours or more ,after which measurements shall be made . 电容器在最低允许温度($\pm 3^{\circ}\text{C}$) 环境当中贮存16小时,其间不施加电压;之后,在标准大气压中露置16小时以上,然后进行测试.</p>	2019/5/25

NO.	ITEM 项目	TEST METHOD 测试方法	SPECIFICATION 规格
4.6	Pressure relief 防爆	<p>Reverse the following rules are applied electric current of DC working voltage 反向施加以下电流的DC工作电压.</p> <p>Where case size 外壳尺寸 (D 直径) : $D \leq 22.4\text{mm}$: 1 A max. $D > 22.4\text{mm}$: 10 A max.</p> <p>Note 注意:</p> <ol style="list-style-type: none"> This requirement applies to capacitors with a diameter of 8 mm or more . 此要求适用于直径8mm或以上之电容器. When the pressure relief dvice does not open even 30 minutes after commencement of test ,the test may be ended . 测试30分钟后防爆装置仍不动作的,试验终止. The pressure relief dvice shall open in such a way as to avoid any dange of fire or explosion of capacitor elements (terminal and metal foil etc) or cover . 防爆装置必须动作,以防止发生火灾、爆炸或金属片飞溅. 	<p>DC test circuit 直流测试电路</p>  <p>S :Switch 开关 A :DC current meter DC电流表 Cx :Testing capacitor 测试电容</p>

5. 外观Marking :

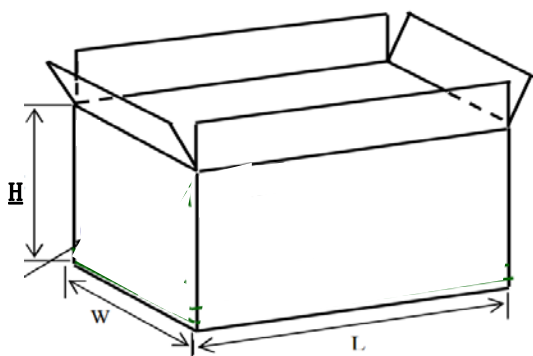
产品外套管印刷内容如下

序号	项目内容说明	图示
(1)	商标	
(2)	标称静电容量	
(3)	额定工作电压	
(4)	负极线标示	
(5)	系列和温度	
(6)	年份+周期(套管材质)	

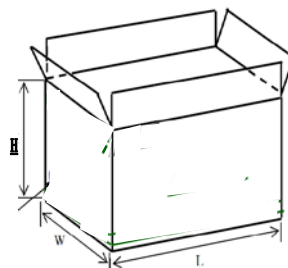
6.包装数量标准:

产品外形尺寸 D×L (mm)	小袋数量 (只/袋)	散装/切脚 (袋/内箱)	散装/切脚内箱 (KPCS)	散装/切脚大箱 (KPCS) (KPCS)	备注
φ3*5	2000+3	25	50	100	
φ4*5-7、φ5*5	1000+2	50	50	100	
φ6.3*5、φ5*7	1000+2	30	30	60	
φ6.3*7、φ5*11/12	1000+2	25	25	50	
φ6.3*11、φ8*5	1000+1	20	温州郎业	40	
φ6.3*12	1000+1	16	16	32	
φ8*7	1000+1	18	18	36	
φ8*9	500+1	30	15	30	
φ8*11/12	500+1	25/25	12.5/12.5	25/25	
φ8*14	500+1	20	10	20	
φ8*16-20	500+1	16	8	16	
φ10*13	500+1	15	7.5	15	
φ10*15	400	15	6	12	
φ10*17-20	200	25	5	10	
φ10*25	200	20	2019/5/25	8	
φ10*30	100	30	3	6	
φ13*17-21	200	15	3	6	
φ13*25	200	12	2.4	4.8	
φ13*30	100	20	2	4	
φ16*18-22	100	20	2	4	
φ16*25	100	15	1.5	3	
φ16*30	100	12	1.2	2.4	
φ16*35	50	20	1	2	
φ18*27	100	10	1	2	
φ18*30	50	15	0.75	1.5	
φ18*36	50	15	0.75	1.5	
φ18*40	50	10	0.5	1.5	
φ18*50	25	15	0.375	0.75	
φ22*30	50	10	0.5	1	
φ22*35	50	10	0.5	1	
φ22*40	50	10	0.5	1	
φ25*25	50	10	0.5	1	
φ25*30	50	10	0.5	1	

备注: 包装外箱L480mm*W320mm*H320mm
内箱L300mm*W230mm*H300mm



外箱



内箱