

HJVD Extra Lower Impedance High Voltage Aluminum Electrolytic Capacitors

Extra lower impedance with temperature range -55~+105°C

Load life of 2000~10000 hours

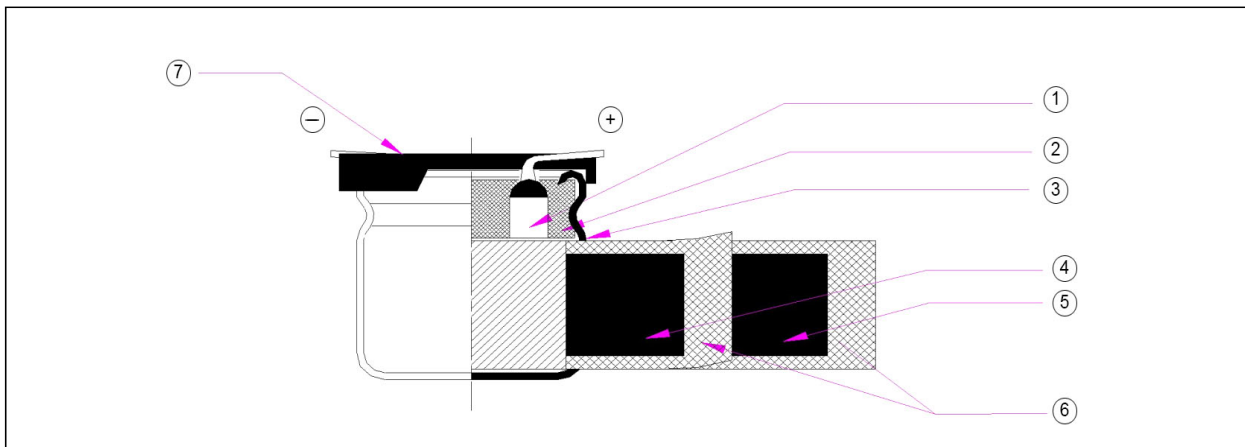
RoHS & REACH compliant, Halogen-free



How to order

<u>HJVD</u>	<u>106</u>	<u>M</u>	<u>0016</u>	<u>0605</u>	<u>R</u>	<u>-</u>
Type	Capacitance code	Tolerance	Rated Voltage	Size Code	Package	Additional characters may be added for special requirements
HVJD	pF Code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow) 106 = 10uF 476 = 47 uF	M: +/-20%	Code 0035: 35VDC For DC Voltage 0016: 16VDC 0025: 25VDC 0050: 50VDC	Code 0405: Size 4x5.4mm Size for V-chip E-cap 0605: Size 6x5.4mm 1010: Size 10x10.5mm 1818: Size 18x18.5mm	R: Tape & Reel	

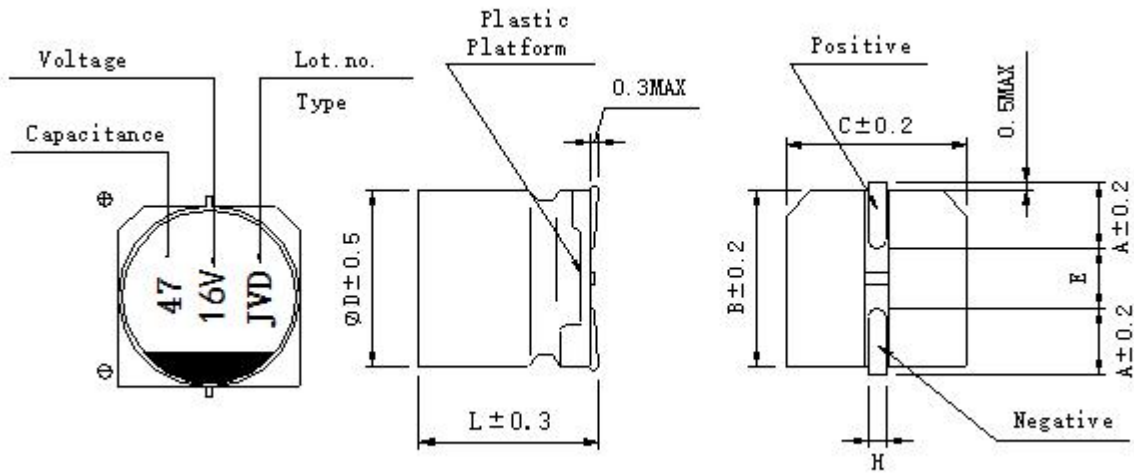
Frame drawing and materials



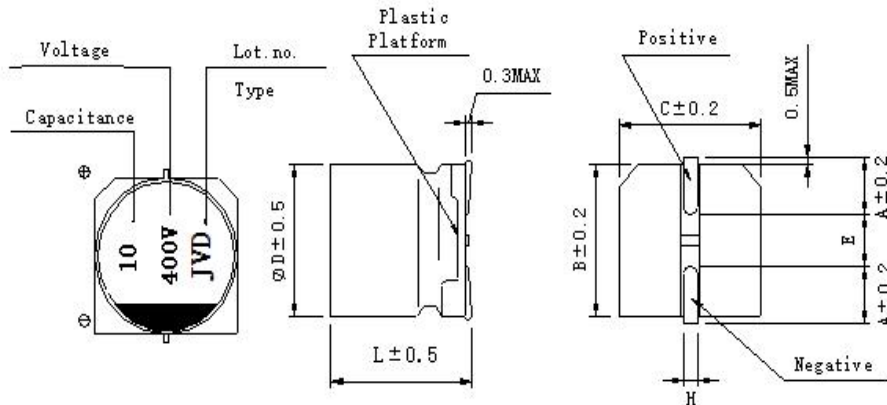
No.	Parts	Material
1	Lead wire	AL- wire LG3+Tin- plating of copper cover steel
2	Rubber stopper	IIR rubber
3	PE- CASE	AL -99.5%
4	AL – foil(+)	Formed AL 99.98% or 99.98%
5	AL – foil(-)	Etched AL 99.7%
6	Separstor paper	Electrolytic Capacitor paper
7	BASE	PPS

Case size table

1. $\phi 4 \sim \phi 6.3$



2. $\phi 8 \sim \phi 18$



(Unit:mm)

ϕD	4 ×	5 ×	6.3 ×	6.3 ×	6.3 ×	8 ×	8 ×	10 ×	10 ×	12.5 ×	12.5 ×	16 ×	18 ×	18 ×	
	5.4	5.4	5.4	7.7	10.5	10.5	12.5	10.5	12.5	13.5	16.5	16.5	16.5	21.5	
A	1.8	2.1	2.4	2.4	2.4	2.9	2.9	3.2	3.2	4.8	4.8	5.8	6.8	6.8	
B	4.3	5.3	6.6	6.6	6.6	8.3	8.3	10.3	10.3	13	13	17	19	19	
C	4.3	5.3	6.6	6.6	6.6	8.3	8.3	10.3	10.3	13	13	17	19	19	
E	1.0	1.3	2.2	2.2	2.2	3.1	3.1	4.5	4.5	4.4	4.4	6.4	6.4	6.4	
L	5.4	5.4	5.4	7.7	10.5	10.5	12.5	10.5	12.5	13.5	16.5	16.5	16.5	21.5	
H	0.5~0.8					0.8 ~ 1.1					1.1~1.4				

Specifications

Items	Characteristics							
Operating Temperature Range	-55°C ~ 105°C (63~100V)							
	-40°C ~ 105°C (160~450V)							
Rated Voltage Range	63V ~ 450V							
Nominal Capacitance Range	1 ~ 680 μF							
Nominal Capacitance Tolerance	±20% (20°C, 120Hz)							
Leakage Current	63~100V				160~450V			
	I ≤ 0.03 CRUR or 4(μA)				I ≤ 0.04CRUR+100(μA)			
	Whichever is greater (at 20°C, After 2 minutes) CR: Nominal Capacitance (μF) UR: Rated voltages (V)				Max. (1 minute)			
Dissipation Factor (Max) 20°C, 120Hz	UR (V)	63	80	100	160	200	250	400~450
	tgδ	0.10	0.10	0.09	0.20	0.20	0.20	0.15

Nominal capacitance, rated voltage, rated ripple current and case size table

V μF	63			80			100		
	D×L mm	Impedance Ω	I~mA	D×L mm	Impedance Ω	I~mA	D×L mm	Impedance Ω	I~mA
3.3				5*5.4	5.50	25			
4.7	5*5.4	1.90	70	6.3*5.4	3.50	40			
10	6.3*5.4	1.20	130	6.3*7.7	2.40	60			
15	6.3*5.4	1.20	130						
22	6.3*7.7	0.90	150	8*10.5	1.30	130	8*10.5	1.30	130
33	8*10.5	0.50	280	8*10.5	1.30	130	10*10.5	0.70	200
47	8*10.5	0.50	280	10*10.5	0.70	200	10*10.5	0.70	200
56	8*10.5	0.50	280	10*10.5	0.70	200	10*10.5	0.70	200
68	10*10.5	0.35	400	12.5*13.5	0.32	500	12.5*13.5	0.32	500
100	10*10.5	0.35	400	10*10.5	0.70	200	16*16.5	0.17	790
150	12.5*13.5	0.16	800	12.5*13.5	0.32	500	16*16.5	0.17	790
220	12.5*13.5	0.16	800				18*16.5	0.15	920
330				16*16.5	0.17	795	18*16.5	0.15	920
470	16*16.5	0.082	1400	18*16.5	0.15	920			
680	18*16.5	0.08	1680						

↳ I~ = Rated ripple current (mA) (105°C, 100KHz) Impedance (Ω) at 20°C 100KHz

Frequency coefficient of ripple current

Frequency	50Hz	120Hz	300Hz	1KHz	≥ 10KHz
Coefficient	0.35	0.50	0.64	0.83	1.00

Nominal capacitance, rated voltage, rated ripple current and case size table

V μF	160		200		250		400	
	D×L mm	I~mA	D×L mm	I~mA	D×L mm	I~mA	D×L mm	I~mA
1	6.3*10.5	25	6.3*10.5	22	6.3*10.5	22	6.3*10.5	25
2.2	6.3*10.5	35	6.3*10.5	32	6.3*10.5	32	6.3*10.5	35
3.3	6.3*10.5	45	6.3*10.5	42	6.3*10.5	42	10*10.5	75
4.7	6.3*10.5	52	6.3*10.5	50	6.3*10.5	50	8*10.5	60
	8*10.5	60	8*10.5	55	6.3*10.5	55	10*10.5	75
5.6	6.3*10.5	57	6.3*10.5	55	8*10.5	55	10*10.5	75
6.8	6.3*10.5	60	6.3*10.5	55	8*12.5	75	10*10.5	82
	8*10.5	70	8*10.5	65	8*10.5	85	10*12.5	90
10	8*10.5	90	8*10.5	85	8*12.5	100	10*12.5	110
12	8*10.5	95	8*10.5	90	8*12.5	110	10*12.5	120
15	8*10.5	110	8*12.5	110	8*12.5	120	12.5*13.5	150
18					10*12.5	150		
22	10*10.5	150	10*10.5	140	10*12.5	165	12.5*16.5	200
33	10*12.5	195	10*12.5	185	12.5*13.5	260	16*16.5	290
47	12.5*13.5	275	12.5*13.5	260	12.5*13.5	280	16*16.5	345
56	12.5*13.5	300	12.5*13.5	280	16*16.5	390	18*16.5	200
68	12.5*13.5	330	12.5*16.5	340	16*16.5	475		

V μF	420		450					
	D×L mm	I~mA	D×L mm	I~mA				
1	6.3*10.5	20	6.3*10.5	20				
2.2	6.3*10.5	30	6.3*10.5	30				
3.3	8*10.5	41	8*10.5	41				
4.7	8*12.5	53	10*10.5	56				
5.6	8*12.5	58	10*10.5	62				
6.8	10*10.5	67	10*10.5	67				
10	10*12.5	90	12.5*13.5	105				
12	12.5*13.5	115	12.5*13.5	115				
15	12.5*13.5	130	12.5*13.5	125				
22	12.5*16.5	165	12.5*16.5	165				
33	16*16.5	235	16*16.5	235				
47	18*16.5	280	18*16.5	300				

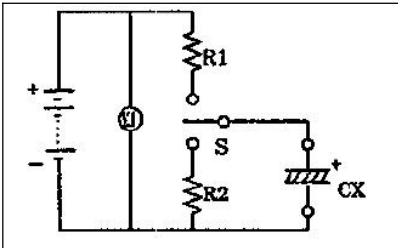
↳ I~ = Rated ripple current (mA) (105°C, 120Hz)

Frequency coefficient of ripple current

Frequency	50Hz	120Hz	300Hz	1KHz	≥ 10KHz
Coefficient	0.80	1.00	1.25	1.40	1.60

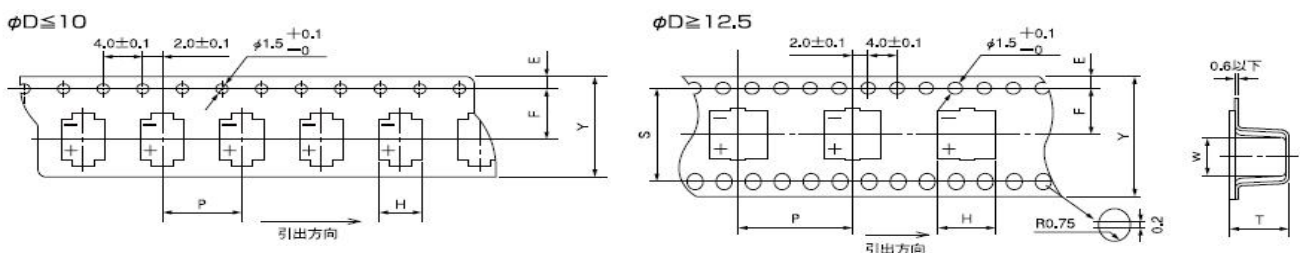
Tests

1	SERIES	HJVD SERIES																																						
2	Rated Voltage	63~450V																																						
3	Operating temperature range operating	operating temperature range is the range of ambient temperature at which the capacitor can be operated continuously at rated voltage SPEC:-55~+105°C (63~100V) -40~+105°C (160~450V)																																						
4	Capacitance	measuring circuit equivalent series circuit																																						
		20°C	measuring temperature																																					
		120HZ	measuring frequency																																					
		0.5Vrms	measuring voltage																																					
		±20% MAX	Nominal Capacitance Tolerance:±20% MAX																																					
5	Tangent of the loss angle	Measurement should be made under the same conditions as those given for the measurement of capacitance SPEC:																																						
		<table border="1"> <tr> <td rowspan="2">tgδ</td> <td>U_R (V)</td> <td>63</td> <td>80</td> <td>100</td> <td>160</td> <td>200</td> <td>250</td> <td>400~450</td> </tr> <tr> <td>tgδ</td> <td>0.10</td> <td>0.10</td> <td>0.09</td> <td>0.20</td> <td>0.20</td> <td>0.20</td> <td>0.15</td> </tr> </table>	tgδ	U _R (V)	63	80	100	160	200	250	400~450	tgδ	0.10	0.10	0.09	0.20	0.20	0.20	0.15																					
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6	Leakage current	the rated voltage shall be applied across the capacitor and its protective resistor which shall be 1000±100Ω. After charging for 2 minutes, calculate the leakage current according to the following equation.																																						
		63~100V				160~450V																																		
		$I \leq 0.03 CRUR$ or 4(μA) Whichever is greater (at 20°C, After 2 minutes) C _R : Nominal Capacitance (μF) U _R : Rated voltages (V)				$I \leq 0.04CRUR + 100(\mu A)$ Max. (1 minute)																																		
7	Maximum permissible ripple current	The maximum sinusoidal alternating current of a frequency specified below, at which the capacitor can be operated continuously. This requirement shall be satisfied even after the measurement of clause 16 (electrical endurance) Where (DC voltage +peak ripple voltage) ≤rated voltage.																																						
8	Characteristics of temperature	<table border="1"> <thead> <tr> <th>step</th> <th>temperature</th> <th>Duration</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>20±2°C</td> <td>15 min</td> </tr> <tr> <td>2</td> <td>minimum operating temperature</td> <td>2 hours</td> </tr> <tr> <td>3</td> <td>20±2°C</td> <td>15 min</td> </tr> <tr> <td>4</td> <td>maximum operating temperature</td> <td>2 hours</td> </tr> </tbody> </table>							step	temperature	Duration	1	20±2°C	15 min	2	minimum operating temperature	2 hours	3	20±2°C	15 min	4	maximum operating temperature	2 hours																	
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		Step1: Capacitance, tangent of the loss angle impedance shall be measured.																																						
Step2: After the capacitor being stored for 2hours, Capacitance, tangent of the loss angle and impedance shall be measured.																																								
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Step4: After the capacitor being stored for 2hours, capacitance and leakage. current shall be measured																																								
		<table border="1"> <thead> <tr> <th>rated voltage</th> <th>63</th> <th>80</th> <th>100</th> <th>160</th> <th>200</th> <th>250</th> <th>400~450</th> </tr> </thead> <tbody> <tr> <td>Z-(-25°C/Z (+20°C)</td> <td>2</td> <td>2</td> <td>2</td> <td>3</td> <td>3</td> <td>3</td> <td>6</td> </tr> <tr> <td>Z-(-40°C/Z (+20°C)</td> <td>3</td> <td>3</td> <td>3</td> <td>6</td> <td>6</td> <td>6</td> <td>10</td> </tr> <tr> <td>Z-(-55°C/Z (+20°C)</td> <td>4</td> <td>4</td> <td>4</td> <td>-----</td> <td>-----</td> <td>-----</td> <td>-----</td> </tr> </tbody> </table>	rated voltage	63	80	100	160	200	250	400~450	Z-(-25°C/Z (+20°C)	2	2	2	3	3	3	6	Z-(-40°C/Z (+20°C)	3	3	3	6	6	6	10	Z-(-55°C/Z (+20°C)	4	4	4	-----	-----	-----	-----						
rated voltage	63	80	100	160	200	250	400~450																																	
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Z-(-55°C/Z (+20°C)	4	4	4	-----	-----	-----	-----																																	

9	Surge test	<p>The capacitor shall be subjected to 1000cycles at a temperature specified below, each consisting of a charge period of 30±5sec, followed by a discharge period of approx. 5min30sec. And the capacitor shall be stored under standard conditions thermal to obtain stability, after which measurements shall be made.</p> <p>measurement circuit.</p>  <table border="1" data-bbox="837 436 1468 683"> <tr> <td>VS: Surge voltage</td> <td>V1: DC voltmeter</td> </tr> <tr> <td>R1: (1KΩ) Protective series resistor</td> <td>R2: Discharge resistor</td> </tr> <tr> <td>CX: Test capacitor</td> <td>S: Switch</td> </tr> </table> <p>SPEC: 1) $\Delta C/C \leq 15\%$ 2) $\text{tg}\delta < \text{Rated value}$ 3) Voltage</p> <table border="1" data-bbox="438 728 1428 918"> <tr> <td>RATED VOLTAGE(V_{DC})</td> <td>63</td> <td>80</td> <td>100</td> <td>160</td> <td>200</td> </tr> <tr> <td>SURGE VOLTAGE(V_{DC})</td> <td>79</td> <td>100</td> <td>125</td> <td>200</td> <td>250</td> </tr> <tr> <td>RATED VOLTAGE(V_{DC})</td> <td>250</td> <td>400</td> <td>420</td> <td>450</td> <td>----</td> </tr> <tr> <td>SURGE VOLTAGE(V_{DC})</td> <td>300</td> <td>450</td> <td>470</td> <td>500</td> <td>----</td> </tr> </table>	VS: Surge voltage	V1: DC voltmeter	R1: (1KΩ) Protective series resistor	R2: Discharge resistor	CX: Test capacitor	S: Switch	RATED VOLTAGE(V _{DC})	63	80	100	160	200	SURGE VOLTAGE(V _{DC})	79	100	125	200	250	RATED VOLTAGE(V _{DC})	250	400	420	450	----	SURGE VOLTAGE(V _{DC})	300	450	470	500	----
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10	Terminal strength	<p>1) tensile</p> <table border="1" data-bbox="438 974 1420 1153"> <thead> <tr> <th>d(mm)</th> <th>[N]</th> <th>Duration time</th> </tr> </thead> <tbody> <tr> <td>0.3<d≤0.5</td> <td>5</td> <td rowspan="3">10±2sec</td> </tr> <tr> <td>0.5<d≤0.8</td> <td>10</td> </tr> <tr> <td>0.8<d≤1.25</td> <td>20</td> </tr> </tbody> </table> <p>2) Bending</p> <p>The terminal shall be subjected to 1 bend in each direction to give a total 2 bends.</p> <table border="1" data-bbox="438 1276 1420 1444"> <thead> <tr> <th>d(mm)</th> <th>[N]</th> </tr> </thead> <tbody> <tr> <td>0.3<d≤0.5</td> <td>2.5 (0.25KG)</td> </tr> <tr> <td>0.5<d≤0.8</td> <td>5.0 (0.51KG)</td> </tr> <tr> <td>0.8<d≤1.25</td> <td>10.0(1.0KG)</td> </tr> </tbody> </table> <p>SPEC: No breaking and loosening of terminal</p>	d(mm)	[N]	Duration time	0.3<d≤0.5	5	10±2sec	0.5<d≤0.8	10	0.8<d≤1.25	20	d(mm)	[N]	0.3<d≤0.5	2.5 (0.25KG)	0.5<d≤0.8	5.0 (0.51KG)	0.8<d≤1.25	10.0(1.0KG)												
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0.8<d≤1.25	10.0(1.0KG)																															
11	Solderability	<p>Solder: H60A. H60S or H63A Solder temperature: 245±2°C Immersion time: 3±0.5sec Immersion depth: 2mm Flux: 25% by weight of rosin in ethanol SPEC: 3/4 of the circumference of the surface up to the immersed shall be covered with new solder.</p>																														
12	Resistance to soldering heat	<p>Solder: H60A. H60S or H63A Solder temperature: 260±5°C or 350±10°C Immersion time: 10±1sec or 3.5±0.5sec Thickness of heat shunt: 1.6mm: 1.6mm SPEC: 1) Change in capacitance: Within ±10% of the initial value 2) tangent of the loss angle: The initial specified value or less. 3) leakage current: The initial specified value or less.</p>																														

13	Vibration	Only endurance conditioning by sweeping shall be made. The entire frequency range, from 10 to 55Hz and return to 10Hz, shall be transversed in 1min. Amplitude (total excursion) 1.5mm, This motion shall be applied for a period of 2hours in each of 3 mutually perpendicular directions (a total of 6 hours) SPEC:1) change in capacitance: within $\pm 5\%$ of the initial value 2) No visible damage
14	Damp heat	the capacitor shall be stored at a temperature of $40\pm 2^\circ\text{C}$ and relative humidity of 90 to 95% for 240 ± 8 hours. And then the capacitor shall be subjected to standard atmospheric conditions for 1 to 2hours, after which measurements shall be made SPEC:1) change in capacitance: within $\pm 15\%$ of the initial value; 2) tangent of loss angle: The initial specified value or less; 3) leakage current: The initial specified value or less.
15	Shelf life	The capacitor shall be stored at 105°C temperature specified below for 1000 hours. During which time no voltage shall be applied. And then the capacitor shall be subjected to standard atmospheric conditions for 1 to 2hours, after which measurements shall be made, Prior to the measurement of leakage current, following conditioning may be made. SPEC:1) change in capacitance: within $\pm 30\%$ of the initial value; 2) tangent of loss angle: within $\pm 300\%$ of the initial value; 3) leakage current: The initial specified value or less.
16	Load life	The rated voltage shall be applied continuously to the capacitor at maximum operating temperature $105\pm 2^\circ\text{C}$ for 2000~8000 hours. And then the capacitor shall be subjected to standard atmospheric conditions for 1to 2hours, after which measurement shall be made. $\Phi D=4, 5$ and 6.3 is 2000hours ; $\Phi D=8, 10$ is 8000hours ; $\Phi D=12.5, 16$ and 18 is 10000hours SPEC:1) change in capacitance: within $\pm 30\%$ of the initial value; 2) tangent of loss angle: within $\pm 300\%$ of the initial value; 3) leakage current: The initial specified value or less.

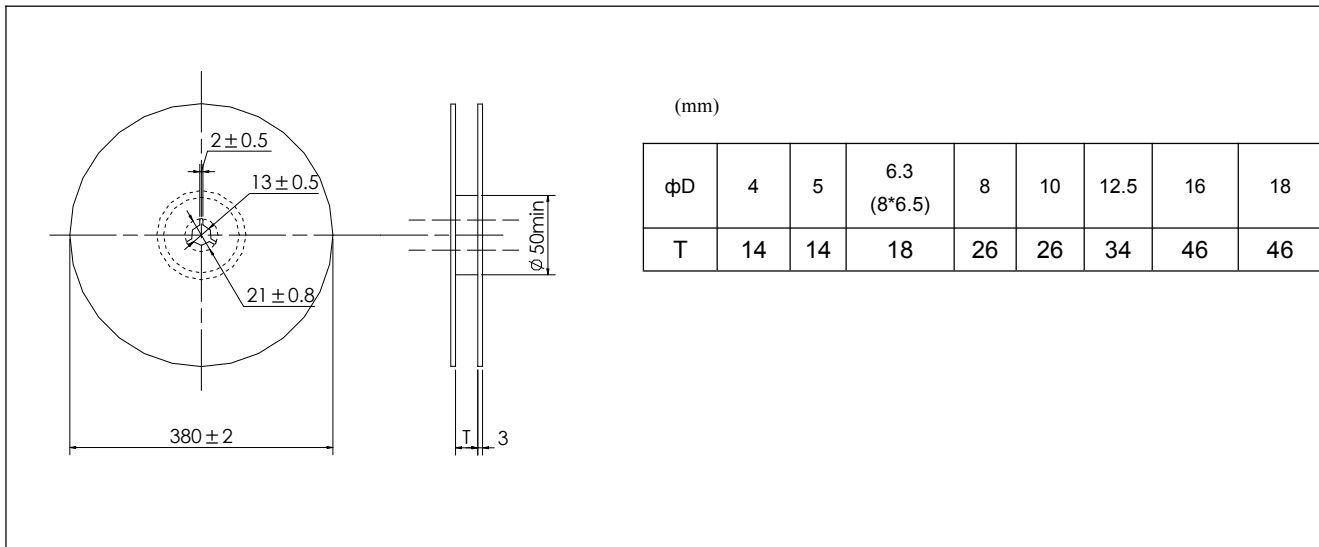
Carrier tape



(Unit:mm)

ΦD×L	4×5.4	5×5.4	6.3× 5.4	6.3× 7.7	6.3* 10.5	8× 10.5	8× 12.5	10× 10.5	10× 12.5	12.5× 13.5	12.5× 16.5	16× 16.5	18× 16.5	18× 21.5
W	12.0	12.0	16.0	16.0	16.0	24.0	24.0	24.0	24.0	32.0	32.0	44.0	44.0	44.0
P	8.0	12.0	12.0	12.0	12.0	16.0	16.0	16.0	16.0	24.0	24.0	28.0	32.0	32.0
F	5.5	5.5	7.5	7.5	7.5	11.5	11.5	11.5	11.5	14.2	14.2	20.2	20.2	20.2
A ₀	5.0	6.0	7.0	7.0	7.0	8.7	8.7	10.7	10.7	13.2	13.2	17.5	19.5	19.5
B ₀	5.0	6.0	7.0	7.0	7.0	8.7	8.7	10.7	10.7	13.2	13.2	17.5	19.5	19.5
T ₂	5.8	5.8	5.8	8.0	11.0	11.0	13.3	11.0	13.3	14.3	17.3	17.3	17.8	22.5

Reel



Package quantity

ΦD×L	Quantity / Reel	pcs/ Small packing box	pcs/ Large packing box
4×5.4	2000pcs	24000pcs	48000pcs
5×5.4	1000pcs	12000pcs	24000pcs
6.3×5.4 , 6.3×7.7 , 8×6.5	1000pcs	10000pcs	20000pcs
8×10.5 , 10×10.5	500pcs	3500pcs	7000pcs
6.3×10.5	800pcs	8000pcs	16000pcs
8×12.5	400pcs	2800pcs	5600pcs
10×12.5	400pcs	2800pcs	5600pcs
12.5×13.5	250pcs	2500pcs	5000pcs
12.5×16.5	200pcs	800pcs	1600pcs
16×16.5	200pcs	800pcs	1600pcs
18×16.5	175pcs	700pcs	1400pcs
18×21.5	125pcs	500pcs	1000pcs