ALUMINUM ELECTROLYTIC CAPACITORS

nichicon

LV

Chip Type, High Voltage.
Long Life.
series

For SMD | Long Life

- Chip Type, high voltage and long life.
- Load life of 10000 hours at +105°C
- Applicable to automatic mounting machine using carrier tape.
- Adapted to the RoHS directive (2011/65/EU).

LV ← Long Life — LR

■Specifications

Item	Performance Characteristics
Category Temperature Range	−40 to +105°C
Rated Voltage Range	160 to 450V
Rated Capacitance Range	3.3 to 33μF
Capacitance Tolerance	±20% at 120Hz, 20°C
Leakage Current	After 1 minute's application of rated voltage, leakage current is not more than 0.04CV+100 (μA).
Tangent of loss angle (tan δ)	Measurement frequency : 120Hz at 20°C

Rated voltage (V)	160	200	250	400	450
tan δ (MAX.)	0.20	0.20	0.25	0.25	0.30

Stability at Low Temperature	Measurement frequency: 120Hz					
Rated voltage (V)		160	200	250	400	450
Impedance ratio ZT / Z20 (MAX.)	Z−40°C / Z+20°C	6	6	10	10	15

Endurance

The specifications listed at right shall be met when the capacitors are restored to 20°C after the rated voltage is applied for 10000 hours at 105°C.

Capacitance change	Within ±30% of the initial capacitance value
tan δ	300% or less than the intial specified value
Leakage current	Less than or equal to the initial specified value

Shelf Life

After storing the capacitors under no load at 105°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.

Resistance to soldering heat

The capacitors are kept on a hot plate for 30 seconds, which is maintained at 250°C and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the characteristic requirements listed at right when they are removed from the plate.

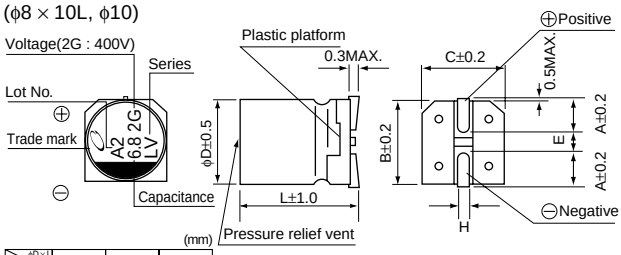
Capacitance change	Within ±10% of the initial capacitance value
tan δ	Less than or equal to the initial specified value
Leakage current	Less than or equal to the initial specified value

Marking

Black print on the case top.

■Chip Type

(φ8 × 10L, φ10)



φD×L	8×10	10×10	10×13.5
A	2.9	3.2	3.2
B	8.3	10.3	10.3
C	8.3	10.3	10.3
E	3.1	4.5	4.5
L	10	10	13.5
H	0.8 to 1.1	0.8 to 1.1	0.8 to 1.1

Voltage

V	160	200	250	400	450
Code	2C	2D	2E	2G	2W

Type numbering system (Example : 400V 6.8μF)

1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	L	V	2	G	6	R	8	M	N	L	1	G	S

- 12 13 14 : Taping code
- 10 11 : Configuration
- 9 : Capacitance tolerance (±20%)
- 6 7 8 : Rated capacitance (6.8μF)
- 4 5 : Rated voltage (400V)
- 2 3 : Series name
- 1 : Type

■Dimensions

Cap.(μF)	V / Code	160 / 2C		200 / 2D		250 / 2E		400 / 2G		450 / 2W	
3.3	3R3									8×10	25
3.9	3R9							8×10	35		
5.6	5R6									10×10	40
6.8	6R8							10×10	50		
7.5	7R5									10×13.5	45
8.2	8R2					8×10	35				
10	100							10×13.5	55		
12	120			8×10	50						
15	150	8×10	50			10×10	50				
18	180			10×10	65	10×13.5	55				
22	220	10×10	65								
27	270			10×13.5	70					Case size φD×L (mm)	Rated ripple
33	330	10×13.5	70								

Rated ripple current (mArms) at 105°C 120Hz

●Frequency coefficient of rated ripple current

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.80	1.00	1.25	1.40	1.60

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.

Taping Specifications for Chip Type Capacitors

※ Please refer to page28 about the FPCAP product spec.

● Carrier tape (mm)

Fig.1 For φ3 to φ10

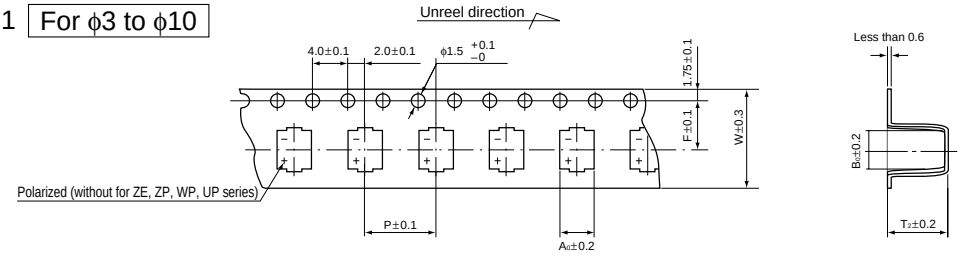
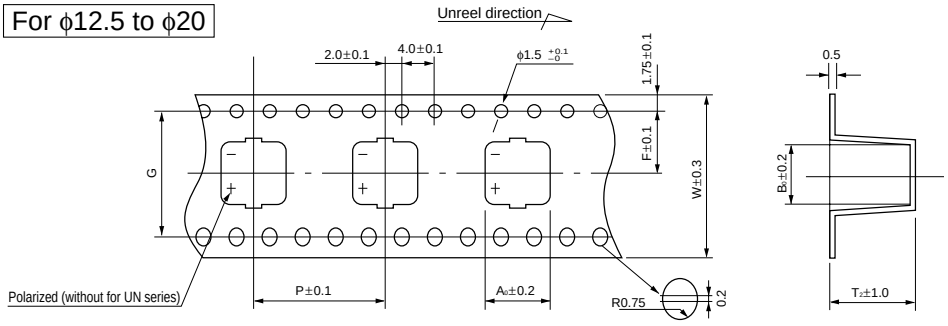
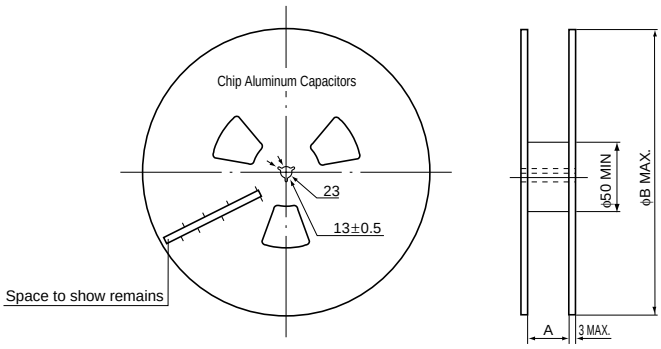


Fig.2 For φ12.5 to φ20



Size	Item							fig.	Series
	W	P	F	A0	B0	T2	G		
φ4 ×5.5 L	12.0	8.0	5.5	4.7	4.7	5.7			
φ5 ×6 L	12.0	12.0	5.5	5.7	5.7	6.3			
φ6.3 ×5.5 L	16.0	12.0	7.5	7.0	7.0	5.7			
φ6.3 ×6 L	16.0	12.0	7.5	7.0	7.0	6.3			
φ6.3 ×8 L	16.0	12.0	7.5	7.0	7.0	8.2			
φ8 ×7 L	24.0	12.0	11.5	8.7	8.7	7.3			
φ8 ×7.5 L	24.0	12.0	11.5	8.7	8.7	8.3			
φ8 ×8 L	24.0	12.0	11.5	8.7	8.7	8.3	—	1	CF, CJ, CK, CG, CS, CV, CX, CR (Conductive Polymer Aluminum Solid Electrolytic Capacitors)
φ8 ×10 L	24.0	16.0	11.5	8.7	8.7	11.0			
φ8 ×10.5 L	24.0	16.0	11.5	8.7	8.7	11.0			
φ8 ×12 L	24.0	16.0	11.5	8.7	8.7	12.3			
φ10 ×8 L	24.0	16.0	11.5	10.7	10.7	8.3			
φ10 ×10 L	24.0	16.0	11.5	10.7	10.7	11.0			
φ10 ×10.5 L	24.0	16.0	11.5	10.7	10.7	11.0			
φ10 ×12.7 L	24.0	16.0	11.5	10.7	10.7	12.8			
φ4 ×3 L	12.0	8.0	5.5	4.7	4.7	3.2			
φ5 ×3 L	12.0	12.0	5.5	5.7	5.7	3.2	—	1	ZD
φ6.3 ×3 L	16.0	12.0	7.5	7.0	7.0	3.2			
φ4 ×3.9 L	12.0	8.0	5.5	4.7	4.7	4.3			
φ5 ×3.9 L	12.0	12.0	5.5	5.7	5.7	4.3	—	1	ZR, ZE, ZG
φ6.3 ×3.9 L	16.0	12.0	7.5	7.0	7.0	4.4			
φ4 ×4.5 L	12.0	8.0	5.5	4.7	4.7	4.9			
φ5 ×4.5 L	12.0	12.0	5.5	5.7	5.7	4.9	—	1	ZS, ZP, ZT
φ6.3 ×4.5 L	16.0	12.0	7.5	7.0	7.0	5.0			
φ3 ×5.4 L	12.0	8.0	5.5	3.6	3.6	5.8			
φ4 ×5.4 L	12.0	8.0	5.5	4.7	4.7	5.8			
φ5 ×5.4 L	12.0	12.0	5.5	5.7	5.7	5.8	—	1	WX, WR, WJ, WP, WT, WZ, WF, WG, UQ
φ6.3 ×5.4 L	16.0	12.0	7.5	7.0	7.0	5.8			
φ8 ×5.4 L	16.0	12.0	7.5	8.7	8.7	5.8			
φ4 ×5.8 L	12.0	8.0	5.5	4.7	4.7	6.3			
φ5 ×5.8 L	12.0	12.0	5.5	5.7	5.7	6.3	—	1	WT, WZ, UT, UP, CD, CL, CM, UD, WD, UR, WS, UA, UL
φ6.3 ×5.8 L	16.0	12.0	7.5	7.0	7.0	6.3			
φ4 ×7 L	12.0	8.0	5.5	4.7	4.7	7.5			
φ5 ×7 L	16.0	12.0	7.5	5.7	5.7	7.5			
φ6.3 ×7 L	16.0	12.0	7.5	7.0	7.0	7.5			
φ6.3 ×7.7 L	16.0	12.0	7.5	7.0	7.0	8.0			
φ6.3 ×8.7 L	16.0	12.0	7.5	7.0	7.0	9.1			
φ6.3 ×10 L	16.0	12.0	7.5	7.0	7.0	11.4			
φ8 ×6.2 L	16.0	12.0	7.5	8.7	8.7	6.8	—	1	WT, WZ, WF, WG, UA, UL, CB, CW, CD, CL, CM, UD, WD, UB, WH, LT, LH, CJ, CZ, CX, UR, WS, UX, LR, LV, UQ, UE, BC
φ8 ×10 L	24.0	16.0	11.5	8.7	8.7	11.0			
φ10 ×7.7 L	24.0	16.0	11.5	10.7	10.7	8.4			
φ10 ×10 L	24.0	16.0	11.5	10.7	10.7	11.0			
φ10 ×13.5 L	24.0	16.0	11.5	10.7	10.7	14.1			
φ12.5 ×13.5 L	32.0	24.0	14.2	14.0	14.0	14.0	28.4		
φ12.5 ×16 L	32.0	24.0	14.2	14.0	14.0	16.3	28.4		
φ12.5 ×21 L	32.0	24.0	14.2	14.0	14.0	21.3	28.4		
φ16 ×16.5 L	44.0	28.0	20.2	17.5	17.5	16.8	40.4		
φ16 ×21.5 L	44.0	28.0	20.2	17.5	17.5	21.8	40.4	2	CD, CX, UG, UJ, UN, UE, BC
φ18 ×16.5 L	44.0	32.0	20.2	19.5	19.5	16.8	40.4		
φ18 ×21.5 L	44.0	32.0	20.2	19.5	19.5	21.8	40.4		
φ20 ×16.5 L	44.0	36.0	20.2	21.5	21.5	17.0	40.4		
φ20 ×21.5 L	44.0	36.0	20.2	21.5	21.5	22.0	40.4		

● Reel ※Please refer to page28 about the FPCAP product spec. (mm)



Package quantity

φD, φD × L	Q'ty / reel
3, 4	2,000pcs.
4 × 7	1,500pcs.
5, 6.3	1,000pcs.
6.3 × 7.7, 6.3 × 8, 8 × 8	900pcs.
6.3 × 8.7	800pcs.
6.3 × 10	600pcs.
8 × 5.4, 8 × 6.2, 8 × 7	1,000pcs.
8 × 10, 10 × 7.7, 10 × 8, 10 × 10	500pcs.
8 × 12, 10 × 12.7, 10 × 13.5	400pcs.
12.5 × 13.5	200pcs.
12.5 × 16	150pcs.
12.5 × 21, 16 × 16.5, 18 × 16.5	125pcs.
20 × 16.5	100pcs.
16 × 21.5, 18 × 21.5	75pcs.
20 × 21.5	50pcs.

Conductive Polymer Aluminum Solid Electrolytic Capacitors

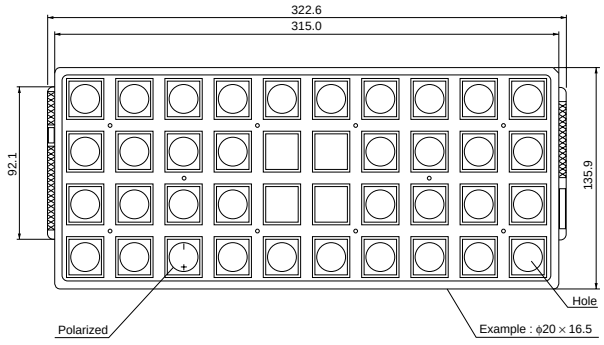
φD	4	5	6.3	8	10
A	14		18	26	
B	382				

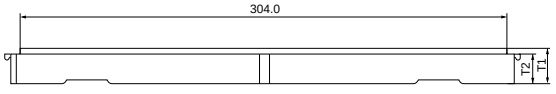
Aluminum Electrolytic Capacitors

φD	3, 4	5×3, 5×3.9, 5×4.5, 5×5.4, 5×5.8	5×7	6.3	8×5.4, 8×6.2	8×7, 8×10, 10×7.7, 10×8, 10×10, 10×13.5	12.5	16, 18, 20
A	14	14	18	18	18	26	34	46
B	382	382	382	382	382	382	332	332

■ Chip tray (for CD, CX, UG, UJ, UN, UE & BC series)

(mm)





Size (φD × L)	T1	T2
12.5 × 13.5, 12.5 × 16	22	18
16 × 16.5, 18 × 16.5, 20 × 16.5	22.5	18.5
12.5 × 21	28	23
16 × 21.5, 18 × 21.5, 20 × 21.5	28.5	23.5

Package quantity

φD	Q'ty / tray
12.5	70pcs.
16	60pcs.
18, 20	40pcs.

FPCAP Packaging Unit Quantity for Reel (SMD Type)

PS, PA, HS, HA, SS, SA, SB, FS, FA, SL, VA, VB, VC, UA, UB series

Components are packaged as per following packing unit.

● Packing Quantity (Reel)

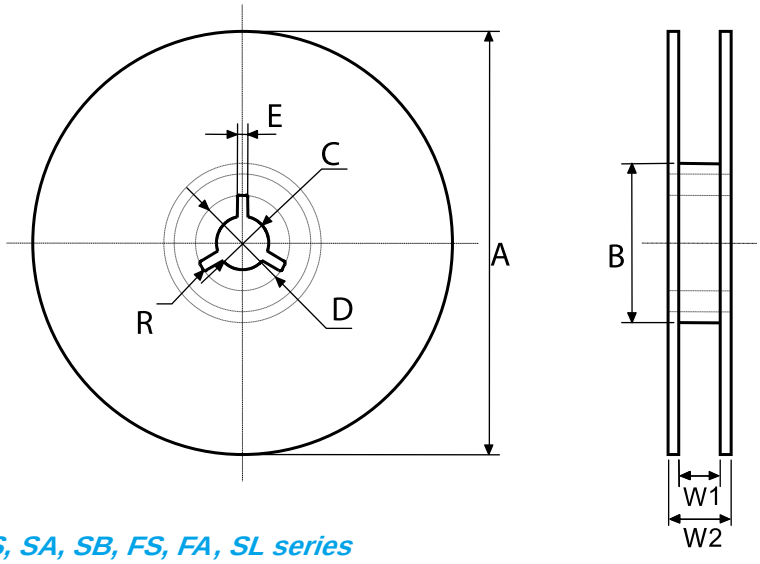
PS, PA, HS, HA, SS, SA, SB, FS, FA, SL series

Case Size φD×L (mm)	Reel (pcs)
φ4×5.2	2,000
φ5×5.7	1,000
φ6.3×4.2	1,000
φ6.3×5.7	1,000
φ6.3×7.7	900
φ8×6.7	1,000
φ8×7.7	900
φ8×8.7	500
φ8×11.7	500
φ10×7.7	500
φ10×12.4	400

VA,VB,VC,UA,UB series

Case Size L×W×H (mm)	Reel (pcs)
7.3x4.3x1.9	3,000
7.3x4.3x2.8	2,500

Note : Please inquire for FPCAP by Packing Unit as above.



PS, PA, HS, HA, SS, SA, SB, FS, FA, SL series

[Unit : mm]

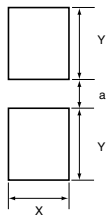
Size (dia)	A ±2.0	B ±1.0	C ±0.5	D ±1.0	E ±0.5	W1 ±1.0	W2 ±1.0	R
Φ4, Φ5	380	80	13.0	21	2.0	13.4	17.4	1.0
Φ6.3	380	80	13.0	21	2.0	17.4	21.4	1.0
Φ8, Φ10	380	80	13.0	21	2.0	25.4	29.4	1.0

VA, VB, VC, UA, UB series

Size L×W×H	A ±2.0	B ±1.0	C ±0.5	D ±1.0	E ±0.5	W1 ±1.0	W2 ±1.0	R
7.3×4.3×1.9	330	80	13.0	21	2.0	13.4	17.4	1.0
7.3×4.3×2.8	330	80	13.0	21	2.0	13.4	17.4	1.0

Surface Mount Type

■ Recommended Land Size (mm)



Size	X	Y	a
φ3	1.6	2.2	0.8
φ4	1.6	2.6	1.0
φ5	1.6	3.0	1.4
φ6.3	1.6	3.5	1.9
φ8×5.5L, φ8×6.2L	2.5	4.0	2.1
φ8 × 10L	2.5	3.5	3.0
φ10	2.5	4.0	4.0

Size	Welded terminal type			Perpendicularly mounted terminal type		
	X	Y	a	X	Y	a
φ12.5	4.0	7.5	7.0	2.0	7.3	3.0
φ16	6.0	8.5	9.5	2.0	7.9	5.3
φ18	6.0	9.5	10.5	2.0	8.9	5.3
φ20	6.0	9.5	12.5	2.4	8.7	7.8

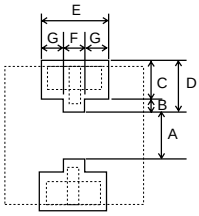
※ A chip product of φ12.5 or more in size and with a bent terminal shape indicates a product where the 11th digit of the product number code is "Q".

● Vibration Resistance Type
(CZ, CX, UE, BC series)

① φ6.3 to 10

Size	X	Y	a
φ6.3 × 10L	3.0	4.0	1.6
φ8 × 10L	4.3	5.3	2.0
φ10 × 10L	4.3	5.6	3.3

② φ12.5 to 20

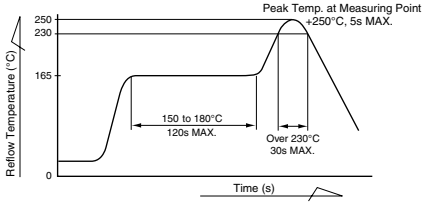


Size	A	B	C	D	E	F	G
φ12.5	3.0	2.3	5.0	7.3	7.0	2.0	2.5
φ16	5.3	2.9	5.0	7.9	7.0	2.0	2.5
φ18	5.3	3.1	5.8	8.9	11.0	2.0	4.5
φ20	7.8	2.9	5.8	8.7	12.0	2.4	4.8

■ Soldering by Reflow

● Table-1

Chip Type Aluminum Electrolytic Capacitors

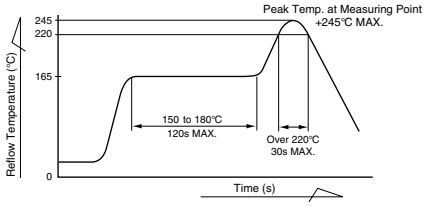


φ10 or Smaller
(ZS, ZP, ZT, WX*1, WR, WP*1, WT*1, WF, WG, UP, UT, UA, UL, CB, CW, CD*2, CL, CM, UD, UB*3, CJ, CZ, CX*2, UR, UX*3, UQ, UE*2, BC*2)
*1φ8×5.4L : Refer to the table-2
*2φ12.5 or greater : Refer to the table-4
*3160 to 400V : Refer to the table-3

- Pre - heating shall be done at +150°C to 180°C and for 120 seconds.
- The temperature at capacitor Top shall not exceed +250°C.
- The duration for over +230°C temperature at capacitor surface shall not exceed 30 seconds.
- The standard temperature profile differs by every reflow method.
- Reflow shall be done within 2 cycles. please make sure the parts have enough cooling down time between the first and second soldering process.
- Please contact us if capacitors are subject to the conditions other than the allowable range of reflow.

● Table-2

Chip Type Aluminum Electrolytic Capacitors

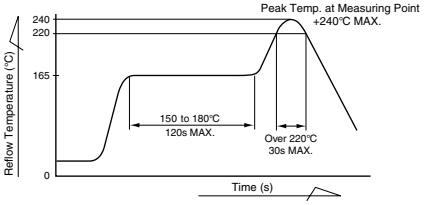


φ8×5.4L (WX, WP, WT)

- Pre - heating shall be done at +150°C to 180°C and for 120 seconds.
- The temperature at capacitor Top shall not exceed +245°C.
- The duration for over +220°C temperature at capacitor surface shall not exceed 30 seconds.
- The standard temperature profile differs by every reflow method.
- Reflow shall be done within 2 cycles. please make sure the parts have enough cooling down time between the first and second soldering process.
- Please contact us if capacitors are subject to the conditions other than the allowable range of reflow.

● Table-3

Chip Type Aluminum Electrolytic Capacitors



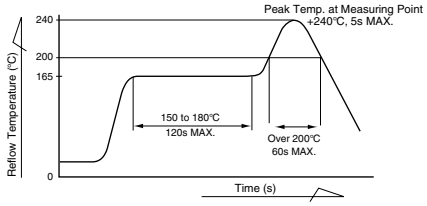
3L, 3.9L (ZD, ZR, ZE, ZG), UX(160 to 400V), UB(160 to 400V) , LT, LH, LR, LV

- Pre - heating shall be done at +150°C to 180°C and for 120 seconds.
- The temperature at capacitor Top shall not exceed +240°C.
- The duration for over +220°C temperature at capacitor surface shall not exceed 30 seconds.
- The standard temperature profile differs by every reflow method.
- Reflow shall be done within 2 cycles. please make sure the parts have enough cooling down time between the first and second soldering process.(φ6.3 : 1 cycle only)
- Please contact us if capacitors are subject to the conditions other than the allowable range of reflow.
- Please contact us if 250°C use of ZG series.

● Table-4

Chip Type Aluminum Electrolytic Capacitors

φ12.5 or greater (CD, CX, UG, UJ, UN, UE, BC)

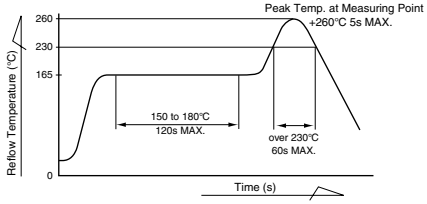


- Pre - heating shall be done at +150℃ to 180℃ and for 120 seconds.
- The temperature at capacitor Top shall not exceed +240℃.
- The duration for over +200℃ temperature at capacitor surface shall not exceed 60 seconds.
- The standard temperature profile differs by every reflow method.
- Reflow shall be done within 2 cycles. please make sure the parts have enough cooling down time between the first and second soldering process.
- Please contact us it capacitors are subject to the conditions other than the allowable range at reflow.

● Table-5

Chip Type Aluminum Electrolytic Capacitors

(For High Temp. Reflow) WJ, WZ, WD, WH, WS



- Pre - heating shall be done at +150℃ to 180℃ and for 120 seconds.
- The temperature at capacitor surface shall not exceed +260℃.
- The duration for over +230℃ temperature at capacitor surface shall not exceed 60 seconds.
- The standard temperature profile differs by every reflow method.
- Reflow shall be done within 2 cycles. please make sure the parts have enough cooling down time between the first and second soldering process.
  (φ8 × 6.2 and φ10 × 10 : 1 cycle only)
- Please contact us if capacitors are subject to the conditions other than the allowable range of reflow.