

ALUMINUM ELECTROLYTIC CAPACITORS

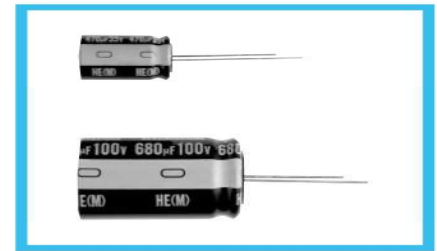
nichicon

HE series Miniature Sized, Low Impedance, High Reliability



- Low impedance and high reliability withstanding 4000 hours to 10000 hours.
- Compliant to the RoHS directive (2002/95/EC).

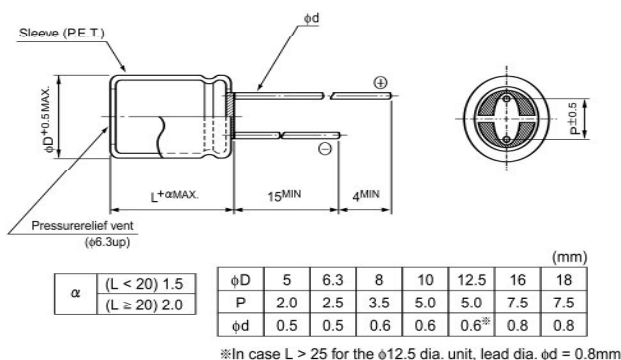
HE Long Life **HD**



Specifications

Item	Performance Characteristics									
Category Temperature Range	-40 to +105°C									
Rated Voltage Range	6.3 to 100V									
Rated Capacitance Range	0.47 to 18000μF									
Capacitance Tolerance	± 20% at 120Hz, 20°C									
Leakage Current	After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3 (μA), whichever is greater.									
Tangent of loss angle (tan δ)	Rated voltage (V)	6.3	10	16	25	35	50	63	100	120Hz 20°C
	tan δ (MAX.)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	
	For capacitance of more than 1000μF, add 0.02 for every increase of 1000μF.									
Stability at Low Temperature	Rated voltage (V)	6.3	10	16	25	35	50	63	100	120Hz
	Impedance ratio ZT / Z20 (MAX.)	Z-25°C / Z+20°C	4	3	2	2	2	2	2	
		Z-40°C / Z+20°C	8	6	4	3	3	3	3	
Endurance	The following specifications shall be met when the capacitors are restored to 20°C after D.C. bias plus rated ripple current is applied at 105°C , the peak voltage shall not exceed the rated voltage.									
	Case size		φD ≤ 6.3		φD = 8 , 10		φD ≥ 12.5			
	Rated voltage (V)	6.3 to 10WV	4000 hours		6000 hours		8000 hours			
		16 to 100WV	5000 hours		7000 hours		10000 hours			
	Capacitance change		Within ± 25% of the initial capacitance value							
	tan δ		200% or less than the initial specified value							
	Leakage current		Less than or equal to the initial specified value							
Marking	Printed with white color letter on black sleeve.									

Radial Lead Type



• Please refer to page 20 about the end seal configuration.

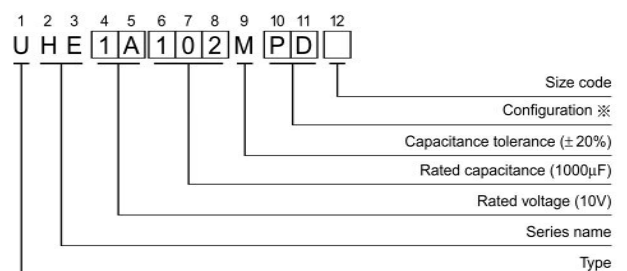
Frequency coefficient of rated ripple current

Cap. (µF)	50Hz	120Hz	300Hz	1kHz	10kHz or more
0.47 to 33	0.45	0.55	0.70	0.90	1.00
39 to 330	0.60	0.70	0.85	0.95	1.00
390 to 1000	0.65	0.75	0.90	0.98	1.00
1200 to 18000	0.75	0.80	0.95	1.00	1.00

Please refer to page 20, 21, 22 about the formed or taped product spec.
Please refer to page 4 for the minimum order quantity.

• Dimension table in next page.

Type numbering system (Example : 10V 1000µF)



※ Configuration

φ D	Pb-free leadwire Pb-free PET sleeve
5	DD
6.3	ED
8 - 10	PD
12.5 to 18	HD

CAT.8100Y

■ Standard Ratings

Cap.(μF)	V (Code)		6.3 (0J)				10 (1A)			
	Code	Item	Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C / 100kHz	Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C / 100kHz
				20°C / 100kHz	-10°C / 100kHz			20°C / 100kHz	-10°C / 100kHz	
100	101						5 × 11	0.58	2.3	210
150	151		5 × 11	0.58	2.3	210				
220	221						6.3 × 11	0.22	0.87	340
330	331		6.3 × 11	0.22	0.87	340				
470	471						8 × 11.5	0.13	0.52	640
680	681		8 × 11.5	0.13	0.52	640	8 × 15	0.087	0.35	840
							▲ 10 × 12.5	0.080	0.32	865
820	821		10 × 12.5	0.080	0.32	865				
1000	102		8 × 15	0.087	0.35	840	8 × 20	0.069	0.27	1050
							▲ 10 × 16	0.060	0.24	1210
1200	122		8 × 20	0.069	0.27	1050	10 × 20	0.046	0.18	1400
			▲ 10 × 16	0.060	0.24	1210				
1500	152		10 × 20	0.046	0.18	1400	10 × 25	0.042	0.17	1650
							▲ 12.5 × 15	0.049	0.16	1450
1800	182		12.5 × 15	0.049	0.16	1450				
2200	222		10 × 25	0.042	0.17	1650	10 × 31.5	0.031	0.12	1910
							▲ 12.5 × 20	0.035	0.12	1900
							● 16 × 15	0.042	0.12	1940
2700	272		▲ 10 × 31.5	0.031	0.12	1910	18 × 15	0.043	0.11	2210
			16 × 15	0.042	0.12	1940				
3300	332		12.5 × 20	0.035	0.12	1900	12.5 × 25	0.027	0.089	2230
3900	392		12.5 × 25	0.027	0.089	2230	12.5 × 31.5	0.024	0.078	2650
			▲ 18 × 15	0.043	0.11	2210	▲ 16 × 20	0.027	0.078	2530
4700	472		12.5 × 31.5	0.024	0.078	2650	12.5 × 35.5	0.020	0.065	2880
5600	562		12.5 × 35.5	0.020	0.065	2880	12.5 × 40	0.017	0.056	3350
			▲ 16 × 20	0.027	0.078	2530	▲ 16 × 25	0.021	0.060	2930
							● 18 × 20	0.026	0.067	2860
6800	682		12.5 × 40	0.017	0.056	3350	16 × 31.5	0.017	0.050	3450
			▲ 16 × 25	0.021	0.060	2930				
			● 18 × 20	0.026	0.067	2860	▲ 18 × 25	0.019	0.049	3140
8200	822		16 × 31.5	0.017	0.050	3450	16 × 35.5	0.015	0.044	3610
							▲ 18 × 31.5	0.015	0.040	4170
10000	103		16 × 35.5	0.015	0.044	3610	16 × 40	0.013	0.038	4080
			▲ 18 × 25	0.019	0.049	3140	▲ 18 × 35.5	0.014	0.038	4220
12000	123		16 × 40	0.013	0.038	4080	18 × 40	0.012	0.032	4280
			▲ 18 × 31.5	0.015	0.040	4170				
15000	153		18 × 35.5	0.014	0.038	4220				
18000	183		18 × 40	0.012	0.032	4280				

▲: In this case, [6] will be put 12th digit type numbering system.

●: In this case, [3] will be put 12th digit type numbering system.

■ Standard Ratings

V (Code) Item Cap.(μF) Code		16 (1C)				25 (1E)			
		Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C / 100kHz	Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C / 100kHz
			20°C / 100kHz	-10°C / 100kHz			20°C / 100kHz	-10°C / 100kHz	
47	470					5 × 11	0.58	2.3	210
56	560	5 × 11	0.58	2.3	210				
100	101					6.3 × 11	0.22	0.87	340
120	121	6.3 × 11	0.22	0.87	340				
220	221					8 × 11.5	0.13	0.52	640
330	331	8 × 11.5	0.13	0.52	640	8 × 15	0.087	0.35	840
470	471	8 × 15	0.087	0.35	840	▲ 10 × 12.5	0.080	0.32	865
		▲ 10 × 12.5	0.080	0.32	865	▲ 10 × 16	0.06	0.24	1210
680	681	8 × 20	0.069	0.27	1050	10 × 20	0.046	0.18	1400
		▲ 10 × 16	0.060	0.24	1210	▲ 12.5 × 15	0.049	0.16	1450
820	821					10 × 25	0.042	0.17	1650
1000	102	10 × 20	0.046	0.18	1400	10 × 31.5	0.031	0.12	1910
		▲ 12.5 × 15	0.049	0.16	1450	▲ 12.5 × 20	0.035	0.12	1900
						● 16 × 15	0.042	0.12	1940
1200	122	10 × 25	0.042	0.17	1650	18 × 15	0.043	0.11	2210
1500	152	10 × 31.5	0.031	0.12	1910	12.5 × 25	0.027	0.089	2230
		▲ 12.5 × 20	0.035	0.12	1900				
		● 16 × 15	0.042	0.12	1940				
1800	182					12.5 × 31.5	0.024	0.078	2650
						▲ 16 × 20	0.027	0.078	2530
2200	222	12.5 × 25	0.027	0.089	2230	12.5 × 35.5	0.020	0.065	2880
		▲ 18 × 15	0.043	0.11	2210	▲ 18 × 20	0.026	0.067	2860
2700	272	12.5 × 31.5	0.024	0.078	2650	12.5 × 40	0.017	0.056	3350
		▲ 16 × 20	0.027	0.078	2530	▲ 16 × 25	0.021	0.060	2930
3300	332	12.5 × 35.5	0.020	0.065	2880	16 × 31.5	0.017	0.050	3450
						▲ 18 × 25	0.019	0.049	3140
3900	392	12.5 × 40	0.017	0.056	3350	16 × 35.5	0.015	0.044	3610
		▲ 16 × 25	0.021	0.060	2930				
		● 16 × 20	0.026	0.067	2860	▲ 18 × 31.5	0.015	0.040	4170
4700	472	16 × 31.5	0.017	0.050	3450	16 × 40	0.013	0.038	4080
		▲ 18 × 25	0.019	0.049	3140	▲ 18 × 35.5	0.014	0.038	4220
5600	562	16 × 35.5	0.015	0.044	3610	18 × 40	0.012	0.032	4280
		▲ 18 × 31.5	0.015	0.040	4170				
6800	682	16 × 40	0.013	0.038	4080				
8200	822	18 × 35.5	0.014	0.038	4220				
10000	103	18 × 40	0.012	0.032	4280				

▲ : In this case, [6] will be put 12th digit type numbering system.

● : In this case, [3] will be put 12th digit type numbering system.

■ Standard Ratings

V (Code) Item Cap.(μF) Code		35 (1V)				50 (1H)			
		Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C / 100kHz	Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C / 100kHz
			20°C / 100kHz	-10°C / 100kHz			20°C / 100kHz	-10°C / 100kHz	
0.47	R47					5 × 11	5.5	22	17
1	010					5 × 11	4	16	30
2.2	2R2					5 × 11	2.5	10	43
3.3	3R3					5 × 11	2.2	8.8	53
4.7	4R7					5 × 11	1.9	7.6	88
10	100					5 × 11	1.5	6	100
22	220					5 × 11	0.70	2.8	180
33	330	5 × 11	0.58	2.3	210				
47	470								
56	560	6.3 × 11	0.22	0.87	340	6.3 × 11	0.30	1.2	295
100	101					8 × 11.5	0.17	0.68	555
120	121					8 × 15	0.12	0.48	730
150	151	8 × 11.5	0.13	0.52	640	10 × 12.5	0.12	0.48	760
180	181					8 × 20	0.091	0.36	910
220	221	8 × 15 ▲10 × 12.5	0.087 0.080	0.35 0.32	840 865	10 × 16	0.084	0.34	1050
270	271	8 × 20	0.069	0.27	1050	10 × 20 ▲12.5 × 15	0.060 0.061	0.24 0.20	1220 1260
330	331	10 × 16	0.060	0.24	1210	10 × 25	0.055	0.22	1440
470	471	10 × 20 ▲12.5 × 15	0.046 0.049	0.18 0.16	1400 1450	10 × 31.5 ▲12.5 × 20 ● 16 × 15	0.043 0.045 0.055	0.17 0.15 0.17	1690 1660 1690
560	561	10 × 25	0.042	0.17	1650	12.5 × 25 ▲18 × 15	0.034 0.054	0.11 0.15	1950 1930
680	681	10 × 31.5 ▲12.5 × 20 ● 16 × 15	0.031 0.035 0.042	0.12 0.12 0.12	1910 1900 1940	12.5 × 31.5	0.030	0.10	2310
820	821					12.5 × 35.5 ▲16 × 20	0.025 0.034	0.083 0.10	2510 2210
1000	102	12.5 × 25 ▲18 × 15	0.027 0.043	0.089 0.11	2230 2210	12.5 × 40 ▲16 × 25 ● 18 × 20	0.021 0.025 0.036	0.069 0.075 0.097	2920 2555 2490
1200	122	12.5 × 31.5 ▲16 × 20	0.024 0.027	0.078 0.078	2650 2530	16 × 31.5 ▲18 × 25	0.022 0.026	0.066 0.070	3010 2740
1500	152	12.5 × 35.5	0.020	0.065	2880	16 × 35.5	0.019	0.057	3150
1800	182	12.5 × 40 ▲16 × 25 ● 18 × 20	0.017 0.021 0.026	0.056 0.060 0.067	3350 2930 2860	16 × 40 ▲18 × 31.5	0.016 0.021	0.048 0.057	3710 3635
2200	222	16 × 31.5 ▲18 × 25	0.017 0.019	0.050 0.049	3450 3140	▲18 × 35.5	0.017	0.046	3680
2700	272	16 × 35.5 ▲18 × 31.5	0.015 0.015	0.044 0.040	3610 4170	18 × 40	0.014	0.038	3800
3300	332	16 × 40 ▲18 × 35.5	0.013 0.014	0.038 0.038	4080 4220				
3900	392	18 × 40	0.012	0.032	4280				

▲ : In this case, [6] will be put 12th digit type numbering system.

● : In this case, [3] will be put 12th digit type numbering system.

■ Standard Ratings

Cap.(μF)	V (Code) Item Code	63 (1J)				100 (2A)			
		Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C / 100kHz	Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C / 100kHz
			20°C / 100kHz	-10°C / 100kHz			20°C / 100kHz	-10°C / 100kHz	
6.8	6R8					5 × 11	2.3	9.3	62
15	150	5 × 11	2.3	9.3	62	6.3 × 11	1.2	5.0	126
27	270					8 × 11.5	0.63	2.8	260
33	330	6.3 × 11	1.2	5.0	126				
39	390					8 × 15	0.45	2.1	335
47	470					10 × 12.5	0.43	1.8	325
56	560	8 × 11.5	0.63	2.8	260	8 × 20	0.33	1.6	408
68	680					10 × 16	0.31	1.5	400
82	820	8 × 15	0.45	2.1	335	10 × 20	0.21	0.94	518
		▲10 × 12.5	0.43	1.8	325	▲12.5 × 15	0.23	1.1	527
100	101					10 × 25	0.20	0.84	595
120	121	8 × 20	0.33	1.6	408	10 × 31.5	0.15	0.71	740
		▲10 × 16	0.31	1.5	400	▲12.5 × 20	0.16	0.64	765
150	151					16 × 15	0.14	0.66	895
180	181	10 × 20	0.21	0.94	518	12.5 × 25	0.12	0.45	875
		▲12.5 × 15	0.23	1.1	527	▲18 × 15	0.12	0.50	1030
220	221	10 × 25	0.20	0.84	595	12.5 × 31.5	0.10	0.42	1010
						▲16 × 20	0.091	0.38	1130
270	271	10 × 31.5	0.15	0.71	740	12.5 × 35.5	0.083	0.35	1140
		▲12.5 × 20	0.16	0.64	765				
		● 16 × 15	0.14	0.66	895	▲16 × 25	0.073	0.27	1350
330	331	12.5 × 25	0.12	0.45	875	12.5 × 40	0.071	0.30	1280
						▲18 × 20	0.080	0.30	1300
390	391	18 × 15	0.12	0.50	1030	16 × 31.5	0.054	0.20	1650
						▲18 × 25	0.057	0.21	1560
470	471	12.5 × 31.5	0.10	0.42	1010	16 × 35.5	0.045	0.17	1900
		▲16 × 20	0.091	0.38	1130	▲18 × 31.5	0.047	0.17	1720
560	561	12.5 × 35.5	0.083	0.35	1140	16 × 40	0.040	0.15	2130
		▲16 × 25	0.073	0.27	1350				
680	681	12.5 × 40	0.071	0.30	1280	18 × 35.5	0.040	0.15	1890
		▲18 × 20	0.080	0.30	1300				
820	821	16 × 31.5	0.054	0.20	1650	18 × 40	0.036	0.13	2470
		▲18 × 25	0.057	0.21	1560				
1000	102	16 × 35.5	0.045	0.17	1900				
		▲18 × 31.5	0.047	0.17	1720				
1200	122	16 × 40	0.040	0.15	2130				
		▲18 × 35.5	0.040	0.15	1890				
1500	152	18 × 40	0.036	0.13	2470				

▲: In this case, [6] will be put 12th digit type numbering system.

●: In this case, [3] will be put 12th digit type numbering system.

Eco-Products “GeoCap”

Nichicon promotes environmentally conscious practices.

Nichicon offers “GeoCap”, which has completely lead free terminals and contains no polyvinyl chloride in the sleeve.

■ Conductive Polymer Aluminum Solid Electrolytic Capacitors

Type · Classification	Series	Lead-Free Compliance	Anti Polyvinyl Chloride Compliance	Page
Surface Mount type	CF, CJ, CK, CG, CS	Complied	Complied	27 ~
Radial Lead type	LF, LE, LG, LS			38 ~

■ Aluminum Electrolytic Capacitors

Type · Classification	Series	Lead-Free Compliance	Anti Polyvinyl Chloride Compliance	Page
Surface Mount type	ZD, ZR, ZE, ZG, ZS, ZP, ZT, WX, WR, WJ, WP, WT, WZ, WF, WG, UP, UT, UA, UL, CB, CW, CD, CL, UD, WD, UB, WH, CJ, UR, WS, UX, UQ, UG, UJ, UN, UH, UE, BC	Complied	Complied	53 ~
Radial Lead type	Ultra-Miniature type MA, MP, MT, MF, MV, SA, SR, SP, ST, SV, SF			109 ~
	Standard type VK, VR, VY, VZ, RS, RZ, RU, RY, VP, EP			119 ~
	High Reliability type PM, PW, TT, PA, HV, HD, HC, HE, HM, HN, HZ, PJ, PS, TS, PV, PT, PZ, PB, CA, CS, CY, PX, BT, BW, BX			140 ~
	For special Circuits KL, TM, JB, AQ, AS			204 ~
	For Audio Equipment KZ, FG, KW, FW, SW, MW, ES, DB, GB, KT			210 ~
Snap-in Terminal type	Standard type LS, LG			223 ~
	High Reliability type GU, GN, GG, GL, GJ, GJ ⁽¹⁵⁾ , GY, GR, GX, GW			231 ~
	For special circuits AD, AK, AQ, AR, QS			256 ~
Screw Terminal type	NR, NX, NK, QR, NW, NY, NT		Available upon request	266 ~
For Audio Equipment	KG, KS, KX		Complied	287 ~

■ Solid Tantalum Electrolytic Capacitors

Type · Classification	Series	Lead-Free Compliance	Anti Polyvinyl Chloride Compliance	Page
Surface Mount type	Reisin-Molded type F91, F92, F93, F97, F98	Complied	Complied	310 ~
	Conformal Coated type MUSE F95, F95, F72, F75			318 ~

■ Decoupling Device for High Frequency

Type · Classification	Series	Lead-Free Compliance	Anti Polyvinyl Chloride Compliance	Page
Surface Mount type	Reisin-Molded type F11, F18	Complied	Complied	326 ~

■ Plastic Film Capacitors

Type · Classification	Series	Lead-Free Compliance	Anti Polyvinyl Chloride Compliance	Page
For Electronic Equipment	XK-(ZH), XK, XT, XP, AK, AP, YX, YS, YP	Complied	Complied	342 ~
For Noise Filter	XL			347
For Electric Equipment	EC, EN, XH			353 ~

Corresponding to RoHS Directive

		Conductive Polymer Aluminum Solid Electrolytic Capacitors		Aluminum Electrolytic Capacitors			
		SMD type	Lead wire terminal type	SMD type	Lead wire terminal type	Snap-in terminal type	Screw terminal type
Corresponding to RoHS Directive		Complied		Complied		Complied (IIG terminal type - Available)	Complied
Material	The portion of the components	Does not contain		(< or=Dia.10mm) Change plating from Sn-Pb to Sn-Bi (> or=Dia.12.5mm) Change plating from Sn-Pb to Sn		Change plating from Sn-Pb to Sn	
Lead (Pb)	Plating on terminals	Ag plating				No plating	
	Insulating Sleeves	Does not contain		No used		Replaced with PET	
	Construction of terminals	Fe/Cu/Ag or Cu/Ag		Fe/Cu/Sn-1.5Bi (<or=Dia 10mm) Fe/Cu/Sn (>or=Dia 12.5mm)	Fe/Cu/Sn	Fe/Cu/Sn	Al
				Cu/Sn (HZ, KZ, FG, ES, DB, GB series)	Cu-Zn/Au (KG series type-III)		
				Plating thickness 12μm Plating type matte No heat treatment after plating	Plating thickness 12μm Plating type matte No heat treatment after plating	Plating thickness 10μm Plating type matte No heat treatment after plating	
	Resistance to soldering heat	Please refer to page 19 for the recommendation reflow condition.	Correspondence to 265°C flow soldering condition	Please refer to page 19 for the recommendation reflow condition.	Correspondence to 260°C flow soldering condition	Correspondence to 260°C flow soldering condition	Not Applicable
	Solderability Tensile strength	No significant solderability difference between Sn-Ag-Cu and Sn-Pb solder.		No significant solderability difference between Sn-Ag-Cu and Sn-Pb solder.	No significant solderability difference between Sn-Ag-Cu and Sn-Pb solder.	No significant solderability difference between Sn-Ag-Cu and Sn-Pb solder.	
Whisker	Whisker	Not applicable		60deg C / 90% 2000h -55 / +85 2000cycle Room Temp. 2000h No difference with Sn-Pb plating	60deg C / 90% 2000h -55 / +85 2000cycle Room Temp. 2000h No difference with Sn-Pb plating	60deg C / 90% 2000h -55 / +85 2000cycle Room Temp. 2000h Whisker is not observed	
Chromium (VI)	Plating material	Does not contain		Does not contain	Does not contain	Does not contain	Available (Chromium (VI) contained in the plating of fixtures)
Mercury		Does not contain		Does not contain		Does not contain	
Cadmium							
PBB							
PBDE							
Identification for RoHS compliance parts		Add "Pb free" marking on outer carton label		Part numbers are changed Add "Pb-free" marking on inner and outer carton label	Part numbers are changed Add "Pb-free" and "PVCless" marking on inner and outer carton label.	Part numbers are changed Add "Pb-free" and "PVCless" marking on outer carton label.	Part numbers are changed Add "RoHS" marking on outer carton label.
MSL LEVEL (IPC/JEDEC J-STD-020D)		Not Applicable No need dry package	Not Applicable No need dry package	Not Applicable No need dry package	Not Applicable No need dry package	Not Applicable No need dry package	Not Applicable No need dry package

Part Numbering for Pb-free Aluminum Electrolytic Capacitors

SMD type

Part Numbers for Pb-free SMD type capacitors represent as follows:

- (1) When certain part numbers are changed because of replacement with Pb-free plated terminals, their 11 digit shows the distinction.

(Example)

1 2 3 4 5 6 7 8 9 10 11 12 13 14
U ZS 1C 100 M CR 1GB (Sn-Pb plated terminals)

1 2 3 4 5 6 7 8 9 10 11 12 13 14
U ZS 1C 100 M CL 1GB (Pb-free plated terminals)

Type Rated Voltage Series Code Rated Capacitance Configuration Capacitance Tolerance TapingCode(Inclusive case diameter and packing spec)

RoHS compliant

□ will be put at 11 digit of numbering system

Exception : ※ 10th digit of the part number also need to be changed for the following series and case size.
8X6.2 case size of WF, UX and UR : **BR to CL**
※ UE, BC series (Vibration Resistance) is only Pb-free and 11th digit the part number change to "S".
※ CD series is only Pb-free. In case of φ12.5 or more: 11th digit the part number change to "Q".

Lead wire terminal type

Part Numbers for Pb-free type capacitors represent as follows:

- (1) When certain part numbers are changed because of replacement with Pb-free plated leadwire and PVC less, sleeves the 11th digit of the part number represents the distinction.

(Example)

1 2 3 4 5 6 7 8 9 10 11
U VZ 1A 331 M EH (Sn-Pb plated leadwire,PVC sleeve)

1 2 3 4 5 6 7 8 9 10 11
U VZ 1A 331 M ED (Pb-free plated leadwire, PET sleeve)

Type Rated Voltage Series Code Rated Capacitance Configuration Capacitance Tolerance

RoHS compliant

□ will be put at 11 digit of numbering system

Exception : 10th digit of the part number also need to be changed for the following series and case size.
8X7 case size of SA, SR and SP **CA to DD**
8X7 case size of ST and SF **CH to DD**
*Configuration code is subject to change by series of case diameter.

Snap-in terminal type

(Example)

1 2 3 4 5 6 7 8 9 10 11 12
L GU 2D 681 M HL A (Sn-Pb plated terminals, PVC sleeve and bottom plate)

1 2 3 4 5 6 7 8 9 10 11 12
L GU 2D 681 M EL A (Pb-free plated terminals, PET sleeve and no bottom plate)

Type Rated Voltage Series Code Rated Capacitance Configuration Case dia. code Capacitance Tolerance

RoHS compliant

□ will be put at 10 digit of numbering system

Screw terminal type

(Example)

1 2 3 4 5 6 7 8 9 10 11 12
L NX 2W 221 M SM G Bracket, Screwbolt, Lock washer (Cr (VI) plating)

1 2 3 4 5 6 7 8 9 10 11 12
L NX 2W 221 M SE G Cr (III) plating

Type Rated Voltage Series Code Rated Capacitance Configuration Case dia. code Capacitance Tolerance

RoHS compliant

□ will be put at 11 digit of numbering system

Corresponding to RoHS Directive

		Solid Tantalum Electrolytic Capacitors			Decoupling Device for High Frequency	
		Resin-Molded Chip F91, F92, F93, F97 series	Frameless Conformal Coated Chip MUSE F95, F95, F72, F75 series	Frameless Resin-Molded Chip F98 series	F11	F18
Corresponding to RoHS Directive		Complied	Complied	Complied	Complied	Complied
Material	The portion of the components	Does not contain	Does not contain	Does not contain	Does not contain	Does not contain
Lead (Pb)	Plating on terminals	Sn	Sn-Cu	Sn-Ag	Au	Sn
	Structural component	Does not contain	Does not contain	Does not contain	Does not contain	Does not contain
		42 Alloy/ Ni / Sn	Ni / Sn-Cu solder	Cu / Ni / Au / Sn-3.5Ag	Cu / Ni / Au	Cu / Ni / Sn
	Construction of terminal	Plating thickness 5μm Plating type matte No heat treatment after plating	Plating thickness 30μm (Solder dipping) No heat treatment after plating	Plating thickness 5μm Plating type matte No heat treatment after plating	Plating thickness 0.05μm Plating type matte No heat treatment after plating	Plating thickness 3μm Plating type matte No heat treatment after plating
	Solderability Shear strength	No significant solderability difference between Sn-Ag-Cu and Sn-Pb solder.	No significant solderability difference between Sn-Ag-Cu and Sn-Pb solder.	No significant solderability difference between Sn-Ag-Cu and Sn-Pb solder.	No significant	No significant
Whisker		60deg C/90% 2000h -55/+85 2000cycle Room Temp. 2000h Whisker is not observed	Not applicable	Not applicable	Not applicable	60deg C/90% 2000h -55/+85 2000cycle Room Temp. 2000h Whisker is not observed
Chromium (VI)		Does not contain	Does not contain	Does not contain	Does not contain	Does not contain
Mercury						
Cadmium						
PBB						
PBDE						
MSL LEVEL (IPC/JEDEC J-STD-020D)		LEVEL 1 No need dry package	※ LEVEL 1 to LEVEL 3 If you need detailed information about NSL LEVEL, please contact your local Nichicon sales office.	LEVEL 1 No need dry package	LEVEL 3 Need dry package	LEVEL 3 Need dry package

		Plastic Film Capacitors		
		Metallized plastic film capacitor XK-(ZH), XK, XT, XP, AK, AP, XL series	Plastic film capacitor for AC Power Based on Applications EC, EN, XH series	Foil type plastic film capacitor YX, YS, YP series
Corresponding to RoHS Directive		Complied	Complied	Complied
Material	The portion of the components	Does not contain	Does not contain	Does not contain
Lead (Pb)	Plating on terminals	Sn plating	Sn plating	Sn plating
	Internal connection, Internal soldering	Does not contain	Does not contain	Does not contain
	Construction of terminals	Fe / Cu / Sn	Fe / Cu / Sn	Fe / Cu / Sn
		Plating thickness 12μm Plating type matte No heat treatment after plating	Plating thickness 3to12μm Plating type matte No heat treatment after plating	Plating thickness 12μm Plating type matte No heat treatment after plating
		Resistance to soldering heat	Correspondence to 260℃ flow soldering condition	Correspondence to 260℃ flow soldering condition
	Solderability Tensile strength	No significant solderability difference between Sn-Ag-Cu and Sn-Pb solder.	No significant solderability difference between Sn-Ag-Cu and Sn-Pb solder.	No significant solderability difference between Sn-Ag-Cu and Sn-Pb solder.
	Whisker	60deg C / 95% 2000h -40 / +85 2000cycle Room Temp. 2000h Whisker is not observed	60deg C / 95% 2000h -40 / +85 2000cycle Room Temp. 2000h Whisker is not observed	60deg C / 95% 2000h -40 / +85 2000cycle Room Temp. 2000h Whisker is not observed
Chromium (VI)		Does not contain	Does not contain	Does not contain
Mercury				
Cadmium				
PBB				
PBDE				
Identification for RoHS compliance parts		Add "Pb free" marking on inner and outer carton label	Add "Pb free" marking on inner and outer carton label	Add "Pb free" marking on inner and outer carton label
MSL LEVEL (IPC/JEDEC J-STD-020D)		Not Applicable No need dry package	Not Applicable No need dry package	Not Applicable No need dry package