

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 <sup>(15)</sup> , 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 (Lug 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		No plating
Lead (Pb)	Plating on terminals	Ag plating		No used		Replaced with PET	
	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
		Plating thickness 12µm Plating type matte No heat treatment after plating		Plating thickness 12µm Plating type matte No heat treatment after plating	Cu/Sn (HZ, KZ, FG, ES, DB, GB series)	Cu-Zn/Au (KG series type-III)	—
	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	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	Does not contain	Does not contain
Cadmium		Does not contain		Does not contain	Does not contain	Does not contain	Does not contain
PBB		Does not contain		Does not contain	Does not contain	Does not contain	Does not contain
PBDE		Does not contain		Does not contain	Does not contain	Does not contain	Does not contain
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.	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	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 | Capacitance Tolerance | Configuration  
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
	Construction of terminal	42 Alloy/ Ni / Sn	Ni / Sn-Cu solder	Cu / Ni / Au / Sn-3.5Ag	Cu / Ni / Au	Cu / Ni / Sn
		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 Plating thickness 12μm Plating type matte No heat treatment after plating	Fe / Cu / Sn Plating thickness 3to12μm Plating type matte No heat treatment after plating	Fe / Cu / Sn Plating thickness 12μm Plating type matte No heat treatment after plating
		Resistance to soldering heat	Correspondence to 260°C flow soldering condition	Correspondence to 260°C 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	