

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.

■ 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, CZ, UR, WS, UX, UQ, UG, UJ, UN, UH, UE, BC	Complied	Complied	61 ~	
Radial Lead type	Ultra-Miniature type	MA, MP, MT, MF, MV, SA, SR, SP, ST, SV, SF			119 ~	
	Standard type	VK, VR, VY, VZ, RS, RZ, RU, RY, VP, EP			129 ~	
	High Reliability type	PM, PW, TT, PA, HV, HD, HE, HM, HN, HZ, PJ, PS, TS, PV, PT, PZ, PB, CA, CS, CY, PX, BT, BW, BX			150 ~	
	For special Circuits	KL, TM, JB, AQ, AS			212 ~	
	For Audio Equipment	KZ, FG, KW, FW, SW, MW, ES, DB, GB, KT			218 ~	
Axial Lead type		VX			134 ~	
Snap-in Terminal type	Standard type	LS, LG			231 ~	
	High Reliability type	GU, GN, GG, GL, GJ, GJ <sup>(15)</sup> , GY, GR, GX, GW			239 ~	
	For special circuits	AK, AQ, AR, QS			266 ~	
Screw Terminal type		NR, NX, NK, NC, QR, NY, NT			Available upon request	275 ~
For Audio Equipment		KG, KS, KX			Complied	296 ~

## Corresponding to RoHS Directive

		Conductive Polymer Aluminum Solid Electrolytic Capacitors				Aluminum Electrolytic Capacitors				
		SMD type(CV, CX series)	Lead wire terminal type(LV, LX series)	SMD type(except CV, CX)	Lead wire terminal type(except LV, LX)	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	Change plating from Sn-Pb to Sn		No plating	
Lead (Pb)	Plating on terminals	Sn plating		Ag plating		> or = Dia. 12.5mm) Change plating from Sn-Pb to Sn	Replaced with PET		—	
	Insulating Sleeves	Does not contain				No used	Replaced with PET		—	
	Construction of terminals	Fe/Cu/Sn		Fe/Cu/Ag or Cu/Ag		Fe/Cu/Sn-1.5Bi (< or = Dia 10mm) Fe/Cu/Sn (> or = Dia 12.5mm)	Cu/Sn (HZ, KZ, FG, ES, DB, GB series)	Cu-Zn/Au (KG series type-III)	Al	
	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 265°C flow soldering condition	Please refer to page 19 for the recommendation reflow 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.				
Whisker	60deg C / 90% 2000h -55 / +85 2000cycle Room Temp. 2000h No difference with Sn-Pb plating		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 Whisker is not observed		—	
Chromium (VI)	Plating material	Does not contain				Does not contain				Available (Chromium (VI) contained in the plating of fixtures)
Mercury		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 "RoHS" marking on outer carton label.	
MSL (IPC/JEDEC J-STD-020D)		Not Applicable				Not Applicable				

## 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 | Taping Code (Inclusive case diameter and packing spec)  
 RoHS compliant

**CL** 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

**ED** 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

**EL** 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

**SE** will be put at 11 digit of numbering system

Corresponding to RoHS Directive

		Solid Tantalum Electrolytic Capacitors		
		Resin-Molded Chip F91, F92, F93, F97 series	Frameless Conformal Coated Chip MUSE F95, F95, F72, F75 series	Frameless Resin-Molded Chip F98 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	Sn-Cu	Au
	Structural component	Does not contain	Does not contain	Does not contain
	Construction of terminal	42 Alloy/ Ni / Sn	Ni / Sn-Cu solder	Cu / Ni / Au
		Plating thickness 5µm Plating type matte No heat treatment after plating	Plating thickness 30µm (Solder dipping) No heat treatment after plating	Au thickness 0.05µm Au 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.
Whisker	60deg C/90% 2000h -55/+85 2000cycle Room Temp. 2000h <span style="border: 1px solid black; padding: 2px;">Whisker is not observed</span>	Not applicable	Not applicable	
Chromium (VI)		Does not contain	Does not contain	Does not contain
Mercury				
Cadmium				
PBB				
PBDE				
MSL (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

		Plastic Film Capacitors		
		Metallized plastic film capacitor XK-(ZH), XK, XP, XT, AK, AP, XL series	Plastic film capacitor for AC Power Based on Applications EC, EN, XH series	Foil type plastic film capacitor YX 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 <span style="border: 1px solid black; padding: 2px;">Whisker is not observed</span>	60deg C / 95% 2000h -40 / +85 2000cycle Room Temp. 2000h <span style="border: 1px solid black; padding: 2px;">Whisker is not observed</span>	60deg C / 95% 2000h -40 / +85 2000cycle Room Temp. 2000h <span style="border: 1px solid black; padding: 2px;">Whisker is not observed</span>	
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 (IPC/JEDEC J-STD-020D)		Not Applicable	Not Applicable	Not Applicable