

**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, CG	Complied	Complied	27 ~
Radial Lead type		LF, LE, LG			34 ~

**■ 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, WJ, WP, WT, WZ, WF, WG, UP, UT, UA, UL, CB, CW, CD, UD, WD, UB, WH, CJ, UR, WS, UX, UQ, UG, UJ, UN, UH, UE, BC	Complied	Complied	47 ~
Radial Lead type	Ultra-Miniature type	MA, MP, MT, MF, MV, SA, SR, SP, ST, SV, SF			97 ~
	Standard type	VK, VR, VY, VZ, RS, RZ, RU, RY, VP, EP			107 ~
	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			128 ~
	For special Circuits	KL, TM, JB, AQ, AS			192 ~
	For Audio Equipment	KZ, FG, KW, FW, SW, MW, ES, DB, GB, KT			198 ~
Snap-in Terminal type	Standard type	LS, LG, DM			211 ~
	High Reliability type	GU, GN, GG, GL, GJ, GJ <sup>(15)</sup> , GK-HH, GY, GR, GX, GW, DQ			219 ~
	For special circuits	AD, AK, AQ, AR, QS			248 ~
Screw Terminal type		NR, NX, NK, QR, NW, NT			
For Audio Equipment		KG, KS, KX		Complied	279 ~

**■ 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	303 ~
	Conformal Coated type	MUSE F95, F95, F72, F75			310 ~
	Conductive Polymer type	F31, F32, F38			316 ~

**■ Decoupling Device for High Frequency**

Type · Classification		Series	Lead-Free Compliance	Anti Polyvinyl Chloride Compliance	Page
Surface Mount type	Reisin-Molded type	F11	Complied	Complied	322 ~

**■ 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	336 ~
For Noise Filter		XL			341
For Electric Equipment		EC, EN, XH			347 ~

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)	
Material	The portion of the components	Does not contain		< $\phi$ =Dia.10mm) Change plating from Sn-Pb to Sn-Bi	Change plating from Sn-Pb to Sn		No plating
	Plating on terminals	Ag plating		> $\phi$ =Dia.12.5mm) Change plating from Sn-Pb to Sn			
Lead (Pb)	Insulating Sleeves	Does not contain		No used	Replaced with PET		—
	Construction of terminals	Fe/Cu/Ag or Cu/Ag		Fe/Cu/Sn-1.5Bi (< $\phi$ =Dia 10mm)	Fe/Cu/Sn	Fe/Cu/Sn	Al
				Fe/Cu/Sn (> $\phi$ =Dia 12.5mm)	Cu/Sn (HZ, KZ, FG, ES, DB, GB series)	Cu-Zn/Au (KG series type-III)	—
				Plating thickness 12 $\mu$ m Plating type matte No heat treatment after plating	Plating thickness 12 $\mu$ m Plating type matte No heat treatment after plating	Plating thickness 10 $\mu$ m 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	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	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-020C)		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)

U ZS 1C 100 M CR 1GB (Sn-Pb plated terminals)

U ZS 1C 100 M CL 1GB (Pb-free plated terminals)

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 series (Vibration Resistance) is only Pb-free and 11th digit the part number change to "S".

- (2) Pb-free capacitors in bulk.  
No change on part numbers  
(Our factory controls distinction in-house.)

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)

U VZ 1A 331 M EH (Sn-Pb plated leadwire,PVC sleeve)

U VZ 1A 331 M ED (Pb-free plated leadwire, PET sleeve)

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.

- (2) Pb-free capacitors in bulk.  
No change on part numbers  
(Our factory controls distinction in-house.)

Snap-in terminal type

(Example)

L GU 2D 681 M HL A (Sn-Pb plated terminals, PVC sleeve and bottom plate)

L GU 2D 681 M EL A (Pb-free plated terminals, PETsleeve and no bottom plate)

RoHS compliant

□ will be put at 10 digit of numbering system

Screw terminal type

(Example)

L NX 2W 221 M SM G Bracket, Screwbolt, Lock washer (Cr (VI) plating)

L NX 2W 221 M SE G Cr (III) plating

RoHS compliant

□ will be put at 11 digit of numbering system

Corresponding to RoHS Directive

		Solid Tantalum Electrolytic Capacitors					Decoupling Device for High Frequency F11
		Resin-Molded Chip F91, F92, F93, F97 series	Frameless Conformal Coated Chip MUSE F95, F96, F72, F75 series	Frameless Resin-Molded Chip F98 series	Conductive polymer Resin-Molded Chip F31, F32 series	Conductive polymer Frameless Resin-Molded Chip F38 series	
Corresponding to RoHS Directive		Complied	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	Does not contain
Lead (Pb)	Plating on terminals	Sn	Sn-Cu	Sn-Ag	Sn	Sn-Ag	Au
	Structural component	Does not contain	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	42 Alloy/ Ni / Sn	Cu / Ni / Au / Sn-3.5Ag	Cu / Ni / Au
		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 5μm Plating type matte No heat treatment after plating	Plating thickness 5μm Plating type matte No heat treatment after plating	Plating thickness 5μm 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 solderability difference between Sn-Ag-Cu and Sn-Pb solder.	No significant solderability difference between Sn-Ag-Cu and Sn-Pb solder.	No significant
Whisker	60deg C/90% 2000h -55/+85 2000cycle Room Temp. 2000h <input type="checkbox"/> Whisker is not observed	Not applicable	Not applicable	60deg C/90% 2000h -55/+85 2000cycle Room Temp. 2000h <input type="checkbox"/> Whisker is not observed	Not applicable	Not applicable	
Chromium (VI)		Does not contain	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-020C)		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	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°C flow soldering condition	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 <input type="checkbox"/> Whisker is not observed	60deg C / 95% 2000h -40 / +85 2000cycle Room Temp. 2000h <input type="checkbox"/> Whisker is not observed	60deg C / 95% 2000h -40 / +85 2000cycle Room Temp. 2000h <input type="checkbox"/> 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-020C)		Not Applicable No need dry package	Not Applicable No need dry package	Not Applicable No need dry package