Reflow Soldering Temperature Profile:



Case	Peak	Max. Time
Code	Temp (°C)	@ 200 °C
		(Sec.)
A, B, C, D	240	40
E, F, G, H	230	30
J, K, L, P		
R, S, U, X		

Outline Drawing



Case Dimensions -

Case					(mm)			
Code	D ±0.5	L	A ±0.2	H (max)	l (ref)	W	P (ref)	К
А	3.0	5.4 +.1,.2	3.3	4.5	1.5	0.55 ± 0.1	0.60	0.35 +0.15 -0.20
В	4.0	*5.4 +.1,.2	4.3	5.5	1.8	$0.65 \ \pm 0.1$	1.00	0.35 +0.15 -0.20
С	5.0	*5.4 +.1,.2	5.3	6.5	2.2	0.65 ± 0.1	1.50	0.35 +0.15 -0.20
D	6.3	*5.4 +.1,.2	6.6	7.8	2.4	0.65 ± 0.1	1.80	0.35 +0.15 -0.20
Х	6.3	7.9 ±.3	6.6	7.8	2.6	0.65 ± 0.1	1.80	0.35 +0.15 -0.20
E	8.0	6.2 ±.3	8.3	9.5	3.4	0.65 ± 0.1	2.20	0.35 +0.15 -0.20
F	8.0	$10.2 \pm .3$	8.3	10.0	3.4	$0.90 \ \pm 0.2$	3.20	0.70 ±0.20
G	10.0	$10.2 \pm .3$	10.3	13.0	3.5	$0.90 \ \pm 0.2$	4.60	0.70 ± 0.20
Н	12.5	$13.5 \pm .5$	13.5	15.0	4.7	$0.90 \ \pm 0.3$	4.40	0.70 ± 0.30
J	10.0	13.5 ±.5	10.3	12.0	3.5	0.90 ± 0.2	4.60	0.70 ±0.20
К	10.0	16.5 ±.5	10.3	12.0	3.5	0.90 ± 0.2	4.60	0.70 ±0.20
L	12.5	$16.5 \pm .5$	13.5	15.0	4.7	0.90 ± 0.3	4.40	0.70 ± 0.30
Р	16.0	$16.5 \pm .5$	17.0	19.0	5.5	1.20 ± 0.3	6.70	0.70 ± 0.30
R	18.0	$16.5 \pm .5$	19.0	21.0	6.5	1.20 ± 0.3	6.70	0.70 ± 0.30
S	18.0	21.5 ±.5	19.0	21.0	6.5	1.20 ± 0.3	6.70	0.70 ± 0.30
U	16.0	21.5 ±.5	17.0	19.0	6.7	1.20 ± 0.3	6.70	0.70 ±0.30

*5.8 $_{\pm.3}$ for AFK and AHD Series

Tape Specifications



Case		(mm)						
Code	W	Α	В	P1	F	t		
A	12.0	3.4	3.5	8.0	5.5	5.8		
В	12.0	4.7	4.6	8.0	5.5	5.8		
С	12.0	6.0	6.0	12.0	5.5	5.8		
D	16.0	7.0	7.0	12.0	7.5	5.8		
Х	16.0	7.0	7.0	12.0	7.5	8.4		
E	16.0	8.7	8.7	12.0	7.5	6.8		
F	24.0	8.7	8.7	16.0	11.5	11.0		
G	24.0	10.7	10.7	16.0	11.5	11.0		



Case				(m	m)			
Code	W	Α	В	С	D	F	Ρ	S
J	32	10.7	10.7	14.5	14.5	14.2	20	28.4
К	32	10.7	10.7	14.5	18.5	14.2	20	28.4
Н	32	14.0	14.0	18.0	14.5	14.2	24	28.4
L	32	14.0	14.0	18.0	17.5	14.2	24	28.4
Р	44	17.5	17.5	23.0	17.5	20.2	28	40.4
R	44	19.5	19.5	26.0	17.5	20.2	32	40.4
S	44	19.5	19.5	26.0	22.5	20.2	32	40.4
U	44	17.5	17.5	23.0	22.5	20.2	28	40.4

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Reel Specifications



Case	-			(mm)			
Code	Α	В	С	D	E	W	t
A, B size	380 ±2.0	50 min	13.0 ±0.5	21.0 ±0.8	2.0 ±0.5	14 ±1.0	3.0
C, D, E, X size	380 ± 2.0	50 min	13.0 ± 0.5	21.0 ±0.8	2.0 ± 0.5	18 ±1.0	3.0
F, G size	380 ± 2.0	50 min	13.0 ± 0.5	21.0 ±0.8	2.0 ± 0.5	26 ±1.0	3.0
J, K, H, L size	330 ±2.0	50 min	13.0 ± 0.5	21.0 ±0.8	2.0 ± 0.5	34 ± 1.0	3.0
P, R, S, U size	330 ±2.0	50 min	13.0 ± 0.5	21.0 ±0.8	2.0 ± 0.5	46 ±1.0	3.0

Land Pattern:



Case	(mm)			
Code	Α	В	С	
А	0.6	2.2	1.5	
В	1.0	2.5	1.6	
С	1.5	2.8	1.6	
D, X	2.2	3.0	1.6	
E	2.2	4.5	1.6	
F	3.2	4.0	2.0	
G	4.6	4.3	2.0	
J, K	4.0	4.5	2.0	
Н	4.0	5.7	2.0	
L	4.0	5.7	2.0	
Р	6.0	6.5	2.5	
U	6.0	6.5	2.5	
R, S	6.0	7.5	2.5	

Cleaning

Below is a table describing the acceptable cleaning agents for cleaning a PC board containing SMT aluminum electrolytic capacitors in vertical cylindrical cans (V-Chips).

			Recommended	Symptoms			
Cleaning Agent	Name	Manufacturer	Use Level	of Damage			
Water Base							
Water Base	Distilled Water		1	None			
Alkaline	Aqua Cleaner 210SEP	Sanei	2				
	Pine Alpha ST-100S	Aralawa Kasei Kogyo	2				
	Clean-thru 750H		2	None though			
Surface active	Clean-thru 750L	Kao Corporation	2	marking ink may			
agent	Clean-thru 710M		2	fade			
	Sun-elec B-12	Sanyo Kasei	2				
	DK be-clean CW-5790	Dai-ichi Kogyo Seiyaku	2				
	S	Solvent Base					
Petroleum	Cold-cleaner P3-375	Henkel Hakusui	3	Swelling on			
Based	Techno-cleaner 219	Seiwa Sangyo	3	sealing rubber, rinse and dry well			
Hydrocarbon	Axarel 32	Mitsui DFC	3	after cleaning			
Alcohol base	lsopropyl Alcohol		1	None			
	Techno-care FRW-17		3	None if used			
Silicon base	Techno-care FRW-1	Toshiba Corporation	3	in			
	(Techno-care FRV-100)		3	combination			
	Asashi-clean AK- 225AES	Ashahi Glass	3	Contains CEC's subject			
Halogenated hydrocarbon	HCFC141B-MS	Daikin Kogyo	3	to environmental regulations			
Telpen base	Telpen-cleaner EC-7R	Nippon Alpha Metals	3	Swelled seal			

Use Level Number	Recommendations				
1	Cleaning is possible				
2	Cleaning is possible (marking may fade)				
3	Cleaning is possible (Use caution. 1 and 2 are better choices)				

V-Chips may be immersed for 5 minutes, safely, in Level 1&2 solvents. Use Level 3 solvents with caution

Do not use chlorine-based halogenated cleaning solvents, adhesives or coating agents.

When halogenated chlorine-based solvents are used in the cleaning process, free chlorine is liberated from the solvent. This chlorine causes corrosion and deterioration of the aluminum inside the capacitor.

Dangers of "Free-Chlorine":

After the solvent dries, the chlorine remains on the capacitor seal, the chlorine slowly permeates into the capacitor element causing corrosion and damage that happens slowly. It may take some time before a failure is apparent. A representation of the chemical reaction is on the following page.

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Reaction of Free-chlorine and Aluminum

Combined free chlorine and hydrogen become hydrochloric acid, but it has high dissociation and most of it becomes chlorine ions. These chlorine ions react with the aluminum. The order of the reactions is represented below.

- 1.) Hydration of oxide film AIO₃ + $3H_2O \longrightarrow 2AI(OH)_3$
- 2.) Reaction of hydrated oxide film and chlorine (Dissolution of film) Al(OH)₃ + 3HCI \longrightarrow AlCl₃ + 3H₂O
- 3.) Reaction of aluminum and hydrochloric acid (Dissolution of aluminum) AI + 3HCI \longrightarrow AICI₃ + 3/2H₂
- 4.) Precipitation of aluminum hydroxide AICI₃ + $3H_2O \longrightarrow AI(OH)_3 + 3HCI$
- The entire reaction can be summerized as the following: AI + AI_2O_3 + $3HCI_3$ + $3H_2O$ \longrightarrow $2AI(OH)_3$ + $AICI_3$ + H3/2

Therefore the compounds produced by the reactions are aluminum hydroxide and hydrochloric acid from reaction #4; the hydrochloric acid is not consumed and acts as a catalyst.

Solvents that should not be used

Composition	Boiling Point (°C)	Common Name
1.1.1 - Trichloroethane	74.1	Chlorosen
Trichloroethylene	87.2	Trichlene
Tetrachloroethylene	121.1	Perchloroenthylene

Additional Cleaning Notes:

- 1.) Solvents containing CFC's destroy the ozone layer and should be avoided to protect the global environment.
- 2.) To avoid solvent residue between the capacitor's seal and the PC board, make sure the assembly is dried thoroughly after cleaning.

Coating _____

Below is a list of coatings that are safe for use with V-Chips

Manufacturer	Material	Coating Material Name
Hitachi Chomical	Acrylic	Taffi -1141, Taffi -1147
	Urethane	Taffi -1154
Boxy Brown	Acrylic	Humi Seal 1B66
Boxy Brown	Urethane	Humi Seal 1A27
Dow Corning	Silicon	Perugan Z, Perugan C
Nihon Zeon	Urethane	Quinate System 160B

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