Formula for calculating the estimated service life of an aluminum electrolytic capacitor

The estimated service life of Hitachi AIC's mid-to-high-pressure aluminum electrolytic capacitor can be expressed as follows:

$$L' = L_0 \times 2^{\frac{(T_0 - T')}{10}} \times \left(\frac{W.V.}{V'} \right)^{2.5} \quad where \ (0.6W.V \leq V' \leq W.V.)$$

To: Maximum core temperature setting when subjected to a maximum permissible ripple load at a maximum operating temperature

Lo: Actual service life at a core temperature To and with rated voltages W and V

L': Estimated service life at a core temperature T' when voltage V' is applied.

The table below shows the Max. core heatup setting when subjected to a permissible ripple current (the value corrected by a specific temperature correction factor).

Max. Core temperature rise setting (snap-in type)

	Ambient temperature (℃)	HF2	HV2	HUL HVL	HP3	HU3 HU4 SS2 SS3	HL1 HL2	XL1
Core heatup setting at each temperature (K)	40	17	17	17	30	30	30	30
	60(55)	12	12	12	20	20	20	20
	70	9	9	9	15	15	15	15
	85	5	5	5	10	10	10	10
	105	—	2	2	—	5	5	5
To (℃)		90	107	107	95	110	110	110
Lo (h)		4,000	4,000	8,000	4,000	4,000	8,000	15,000
Guaranteed service life (h)		2,000	2,000	5,000	2,000	2,000	5,000	10,000

※PS2, US2 series ; Consult Hitachi : AIC

Max. Core temperature rise setting (screw terminal type)

	Ambient temperature (℃)	HCG7	HCGH (250W.V 以下)	HCGH (400W.V)	HCGF5 HCGF6	FXA FX2	GXA GX2 (500V)	HXA	FXR	GXR	GXH
Core temperature rise setting at each temperature (K)	40	21	31	35	31	35	35	35	40	40	—
	60(55)	15	22	30	19	25	25	25	30	33	35
	70	—	12.5	15	12.5	—	—	—	—	—	—
	85	5	5	8.5	5	8.5	20	5	10	26	25
	105	—	2	5	—	—	5	—	—	6.5	10
To (℃)		90	107	110	90	93.5	110	90	95	111.5	115
Lo (h)		4,000	4,000	4,000	4,000	8,000	8,000	20,000	8,000	8,000	8,000
Guaranteed service life (h)		2,000	2,000	2,000	2,000	5,000	5,000	20,000	5,000	5,000	5,000

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