



**THE DATASHEET OF
EEV-HA1V221P**



Surface Mount Type

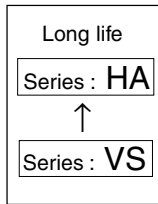
Series : HA

■ Features

- Life time: 105°C 1000 h
- 5.5 mm height ($\leq \phi 6.3$)

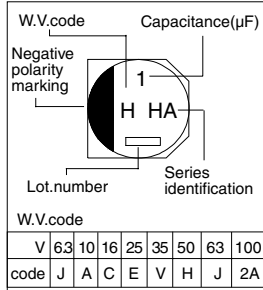
■ Specifications

Operating Temp. Range	-40 to +105°C									
Rated W.V. Range	6.3 to 100 V .DC									
Nominal Cap. Range	0.1 to 1500 μ F									
Capacitance Tolerance	$\pm 20\%$ (120Hz/+20°C)									
D.C. Leakage Current	$I \leq 0.01 CV$ or 3(μ A) after 2 minutes (Whichever is greater)									
Dissipation Factor (tan δ)	Refer to standard products table.									
Characteristics at Low Temperature	W.V. (V)	6.3	10	16	25	35	50	63	100	(Impedance ratio max at 120 Hz)
	-25 / +20 °C	4	3	2	2	2	2	3	3	
	-40 / +20 °C	8	6	4	4	3	3	4	4	
Endurance	After applying rated working voltage for 1000 hours for B~D size, 2000 hours for E~G size at +105°C and then being stabilized at +20°C, capacitors shall meet the following limits .									
	Capacitance change	$\pm 20\%$ of initial measured value ($\pm 30\%$ for E~G size of 6.3V & UP suffix)								
	D.F.	$\leq 200\%$ of initial specified value ($\leq 300\%$ for E~G size of 6.3V & UP suffix)								
	D.C leakage current	\leq initial specified value								
Shelf Life	After storage for 1000 hours at +105°C $\pm 2^\circ$ C with no voltage applied and then being stabilized at +20°C, capacitor shall meet the limits specified in "Endurance." (With voltage treatment)									
	After reflow soldering (refer to Application Guidelines) and then being stabilized at +20°C, capacitor shall meet the following limits.									
Resistance to Soldering Heat	After reflow soldering (refer to Application Guidelines) and then being stabilized at +20°C, capacitor shall meet the following limits.									
	Capacitance change	$\pm 10\%$ of initial measured value								
	D.F.	\leq initial specified value								
	D.C leakage current	\leq initial specified value								

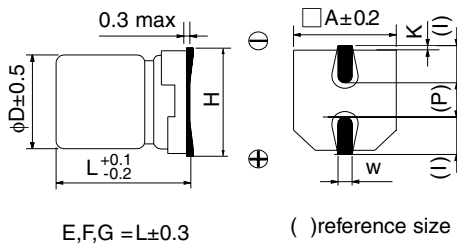


■ Marking

Example; 50V1 μ F (polarized)



■ Dimensions in mm (not to scale)



Size code	D	L	A	H	I	W	P	K
B	4.0	5.4	4.3	5.5 MAX	1.8	0.65 \pm 0.1	1.0	0.35 ^{+0.15} _{-0.20}
C	5.0	5.4	5.3	6.5 MAX	2.2	0.65 \pm 0.1	1.5	0.35 ^{+0.15} _{-0.20}
D	6.3	5.4	6.6	7.8 MAX	2.6	0.65 \pm 0.1	1.8	0.35 ^{+0.15} _{-0.20}
D ₈	6.3	7.9	6.6	7.8 MAX	2.6	0.65 \pm 0.1	1.8	0.35 ^{+0.15} _{-0.20}
E	8.0	6.2	8.3	9.5 MAX	3.4	0.65 \pm 0.1	2.2	0.35 \pm 0.2
F	8.0	10.2	8.3	10.0 MAX	3.4	0.90 \pm 0.2	3.1	0.70 \pm 0.2
G	10.0	10.2	10.3	12.0 MAX	3.5	0.90 \pm 0.2	4.6	0.70 \pm 0.2

■ Case size

- Polarized

w.v.	6.3 (0J)	10 (1A)	16 (1C)	25 (1E)	35 (1V)	50 (1H)	63 (1J)	100 (2A)
0.1						B		
0.22						B		
0.33						B		
0.47						B		
1.0						B		
2.2						B		
3.3						B		E
4.7				B	B	C		E,F
10			B	B,C	B,C	D	E	F
22	B	B	B,C	C,D	C,D	E	E,F	F,G
33	B	B,C	C	C,D	D,E	D ₈ ,E,F	G	G
47	B,C	C	C,D	D,E	E,F	D ₈ ,F,G	F,G	
100	C,D	D,E	D	E,F	D ₈ ,F,G	F,G		
220	D	D ₈ ,F	D ₈ ,F,G	F,G	F,G	G		
330	D ₈ ,F		F,G	F,G	G			
470	F	F,G	F,G	G				
1000	F,G	G						
1500	G							

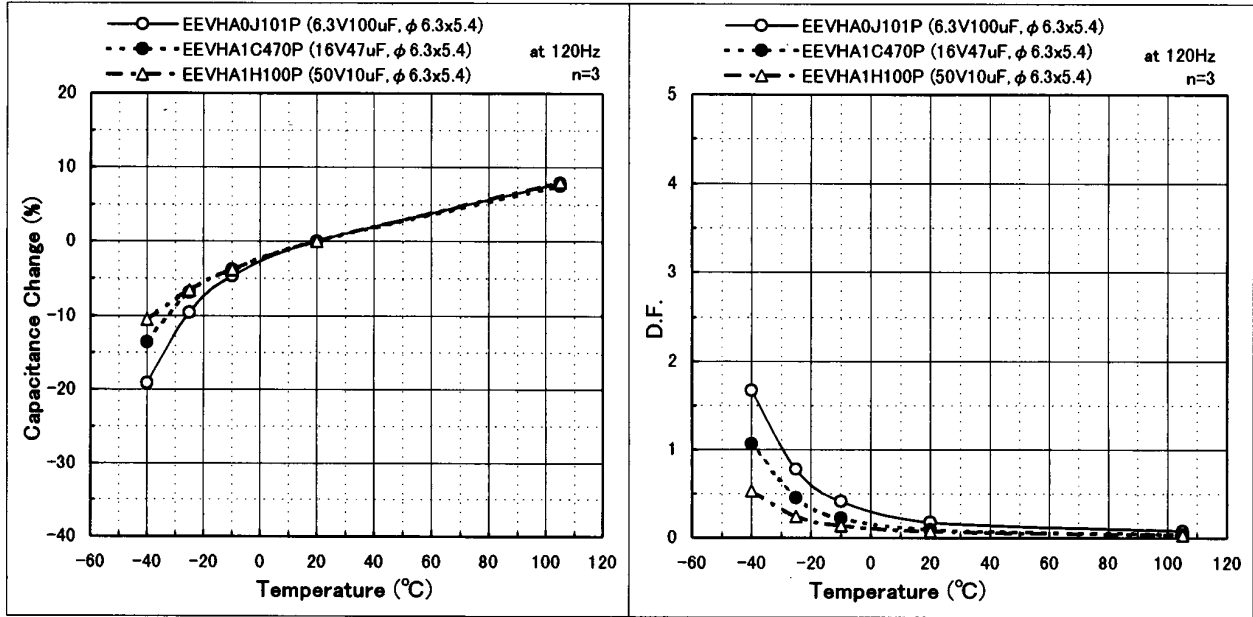
Standard Products

W.V. [V.DC]	Cap. [μF]	Part No.	tan δ	R.C. [mA rms]	Size [mm]	
					D	L
6.3	22	EEVHA0J220R	0.30	29	4	5.4
	33	EEVHA0J330WR	0.35	29	4	5.4
	47	EEVHA0J470WR	0.35	36	4	5.4
		EEVHA0J470R	0.30	46	5	5.4
	100	EEVHA0J101WR	0.35	47	5	5.4
		EEVHA0J101P	0.30	71	6.3	5.4
	220	EEVHA0J221WP	0.35	74	6.3	5.4
	330	EEVHA0J331XP	0.30	105	6.3	7.9
	470	EEVHA0J331P	0.35	230	8	10.2
		EEVHA0J471UP	0.35	300	8	10.2
1000	EEVHA0J102UP	0.35	300	8	10.2	
	EEVHA0J102P	0.35	400	10	10.2	
1500	EEVHA0J152P	0.35	480	10	10.2	
10	22	EEVHA1A220WR	0.30	28	4	5.4
	33	EEVHA1A330WR	0.30	29	4	5.4
		EEVHA1A330R	0.22	43	5	5.4
	47	EEVHA1A470WR	0.30	43	5	5.4
	100	EEVHA1A101WP	0.30	70	6.3	5.4
		EEVHA1A101P	0.26	110	8	6.2
	220	EEVHA1A221XP	0.22	105	6.3	7.9
		EEVHA1A221P	0.26	160	8	10.2
	470	EEVHA1A471UP	0.26	200	8	10.2
		EEVHA1A471P	0.26	270	10	10.2
1000	EEVHA1A102P	0.26	580	10	10.2	
16	10	EEVHA1C100R	0.16	28	4	5.4
	22	EEVHA1C220WR	0.26	28	4	5.4
		EEVHA1C220R	0.16	39	5	5.4
	33	EEVHA1C330WR	0.26	35	5	5.4
		EEVHA1C470WR	0.26	39	5	5.4
	47	EEVHA1C470P	0.16	70	6.3	5.4
		EEVHA1C101WP	0.26	70	6.3	5.4
	220	EEVHA1C221XP	0.16	105	6.3	7.9
		EEVHA1C221UP	0.20	150	8	10.2
	330	EEVHA1C221P	0.20	210	10	10.2
EEVHA1C331UP		0.20	170	8	10.2	
470	EEVHA1C331P	0.20	230	10	10.2	
	EEVHA1C471UP	0.20	190	8	10.2	
EEVHA1C471P	0.20	340	10	10.2		
25	4.7	EEVHA1E4R7R	0.14	22	4	5.4
	10	EEVHA1E100WR	0.20	22	4	5.4
		EEVHA1E100R	0.14	28	5	5.4
	22	EEVHA1E220WR	0.20	35	5	5.4
		EEVHA1E220P	0.14	55	6.3	5.4
	33	EEVHA1E330WR	0.20	42	5	5.4
		EEVHA1E330P	0.14	65	6.3	5.4
	47	EEVHA1E470WP	0.20	70	6.3	5.4
		EEVHA1E470P	0.16	91	8	6.2
	100	EEVHA1E101UP	0.16	91	8	6.2
EEVHA1E101P		0.16	130	8	10.2	
220	EEVHA1E221UP	0.16	160	8	10.2	
	EEVHA1E221P	0.16	190	10	10.2	

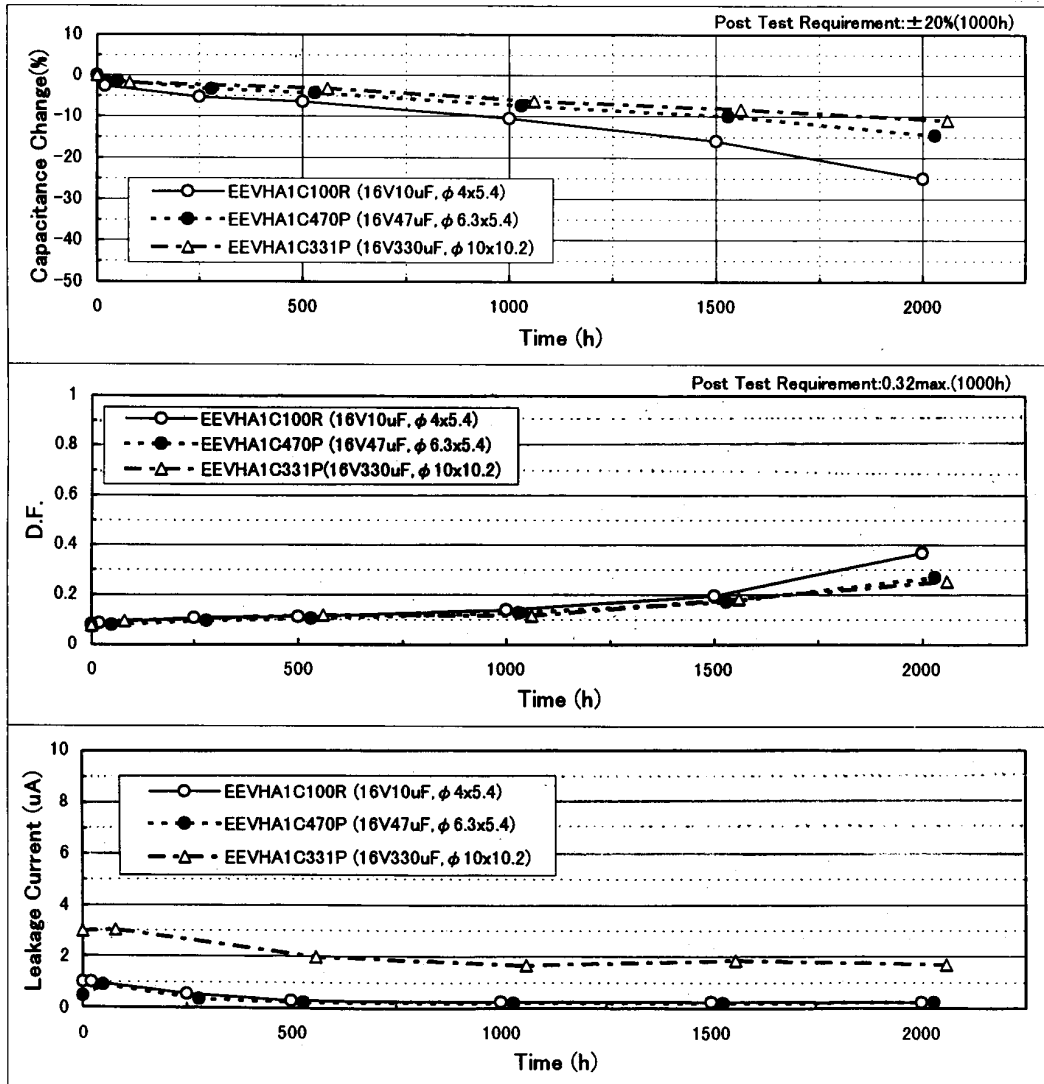
W.V. [V.DC]	Cap. [μF]	Part No.	tan δ	R.C. [mA rms]	Size [mm]	
					D	L
25	330	EEVHA1E331UP	0.16	180	8	10.2
		EEVHA1E331P	0.16	340	10	10.2
	470	EEVHA1E471P	0.16	360	10	10.2
35	4.7	EEVHA1V4R7R	0.12	22	4	5.4
	10	EEVHA1V100WR	0.16	22	4	5.4
		EEVHA1V100R	0.12	30	5	5.4
	22	EEVHA1V220WR	0.16	35	5	5.4
		EEVHA1V220P	0.12	60	6.3	5.4
	33	EEVHA1V330WP	0.16	42	6.3	5.4
		EEVHA1V330P	0.14	84	8	6.2
	47	EEVHA1V470UP	0.14	84	8	6.2
		EEVHA1V470P	0.14	98	8	10.2
	100	EEVHA1V101XP	0.12	84	6.3	7.9
EEVHA1V101UP		0.14	120	8	10.2	
EEVHA1V101P		0.14	160	10	10.2	
220	EEVHA1V221UP	0.14	170	8	10.2	
	EEVHA1V221P	0.14	210	10	10.2	
330	EEVHA1V331P	0.14	250	10	10.2	
50	0.1	EEVHA1HR10R	0.12	1	4	5.4
	0.22	EEVHA1HR22R	0.12	2	4	5.4
	0.33	EEVHA1HR33R	0.12	3	4	5.4
	0.47	EEVHA1HR47R	0.12	5	4	5.4
	1	EEVHA1H1R0R	0.12	10	4	5.4
	2.2	EEVHA1H2R2R	0.12	16	4	5.4
	3.3	EEVHA1H3R3R	0.12	16	4	5.4
	4.7	EEVHA1H4R7R	0.12	23	5	5.4
	10	EEVHA1H100P	0.12	35	6.3	5.4
	22	EEVHA1H220P	0.12	70	8	6.2
EEVHA1H330XP		0.12	60	6.3	7.9	
33	EEVHA1H330UP	0.12	70	8	6.2	
	EEVHA1H330P	0.12	91	8	10.2	
47	EEVHA1H470XP	0.12	63	6.3	7.9	
	EEVHA1H470UP	0.12	95	8	10.2	
100	EEVHA1H470P	0.12	100	10	10.2	
	EEVHA1H101UP	0.12	110	8	10.2	
220	EEVHA1H101P	0.12	120	10	10.2	
	EEVHA1H221P	0.12	150	10	10.2	
63	10	EEVHA1J100P	0.18	25	8	6.2
	22	EEVHA1J220UP	0.18	30	8	6.2
		EEVHA1J220P	0.18	30	8	10.2
	33	EEVHA1J330P	0.18	45	10	10.2
47	EEVHA1J470UP	0.18	50	8	10.2	
	EEVHA1J470P	0.18	50	10	10.2	
100	3.3	EEVHA2A3R3P	0.18	30	8	6.2
	4.7	EEVHA2A4R7UP	0.18	30	8	6.2
		EEVHA2A4R7P	0.18	50	8	10.2
	10	EEVHA2A100P	0.18	55	8	10.2
	22	EEVHA2A220UP	0.18	55	8	10.2
		EEVHA2A220P	0.18	60	10	10.2
33	EEVHA2A330P	0.18	65	10	10.2	

tan δ = at 120Hz/+20°C, Ripple current = at 120Hz/+105°C

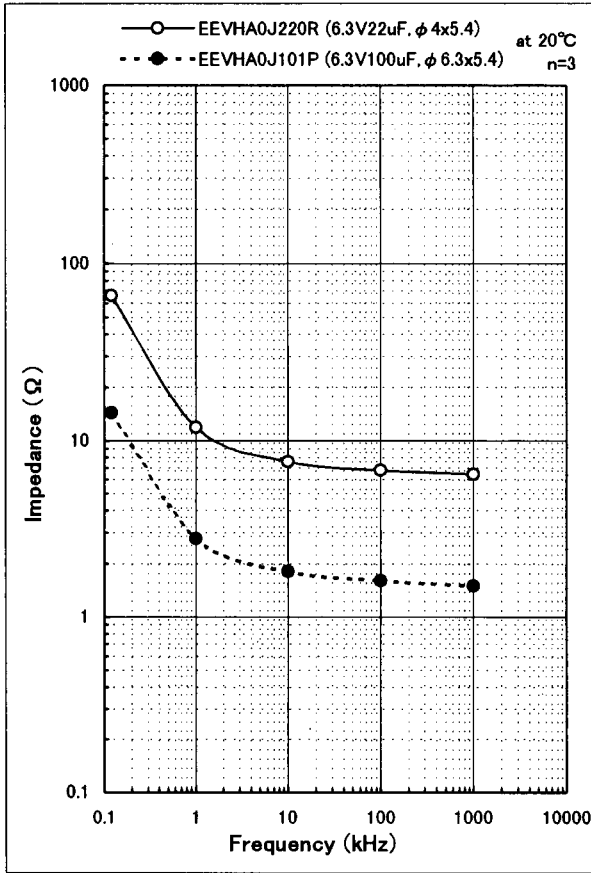
Temperature Characteristics Data



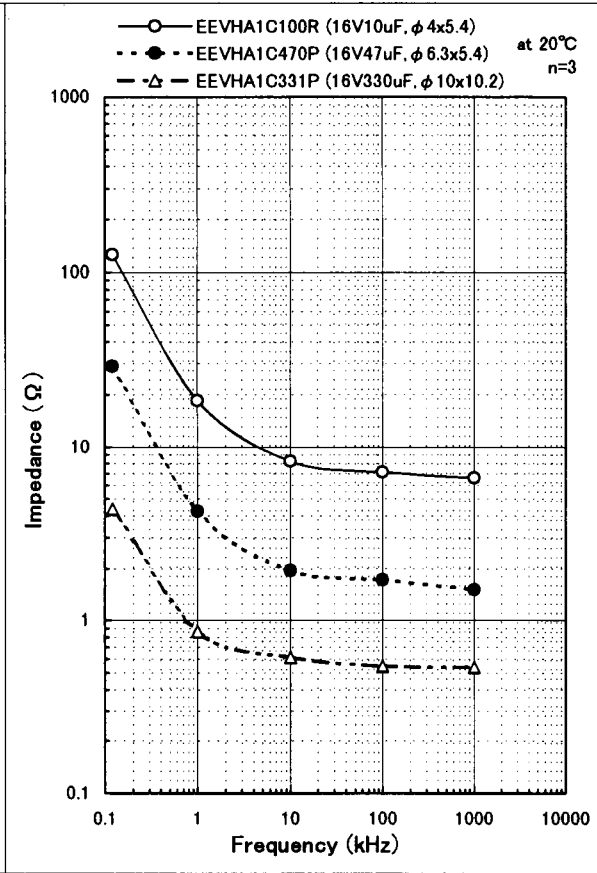
Load Life Data



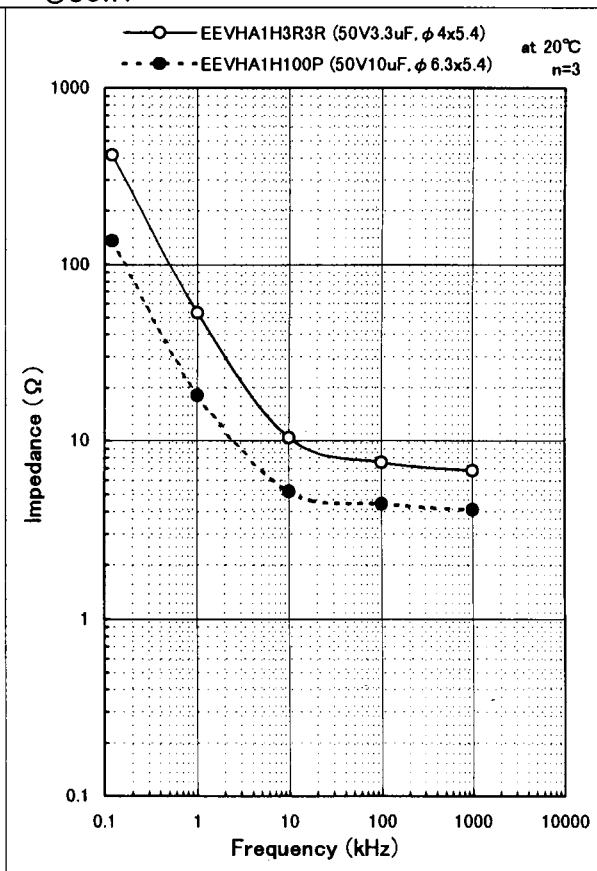
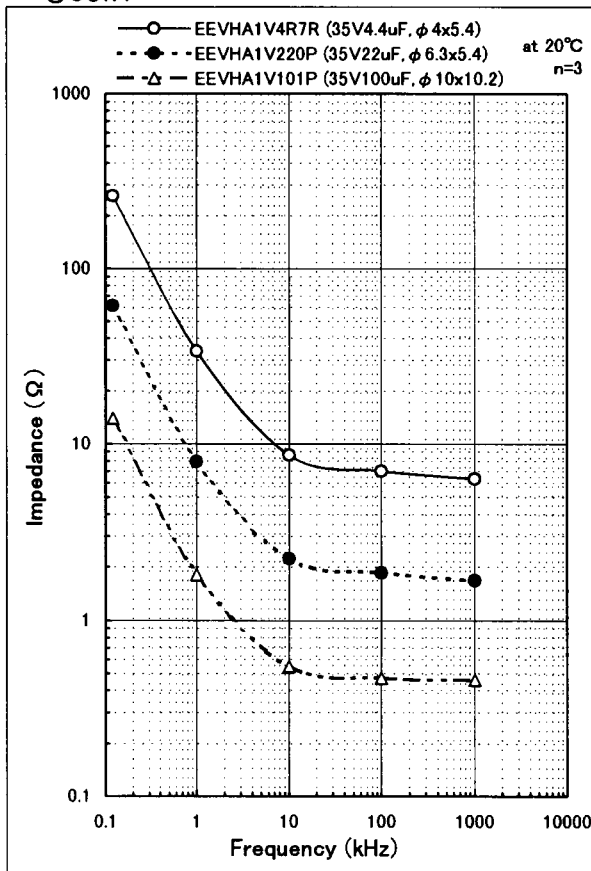
■ Frequency Characteristics Data



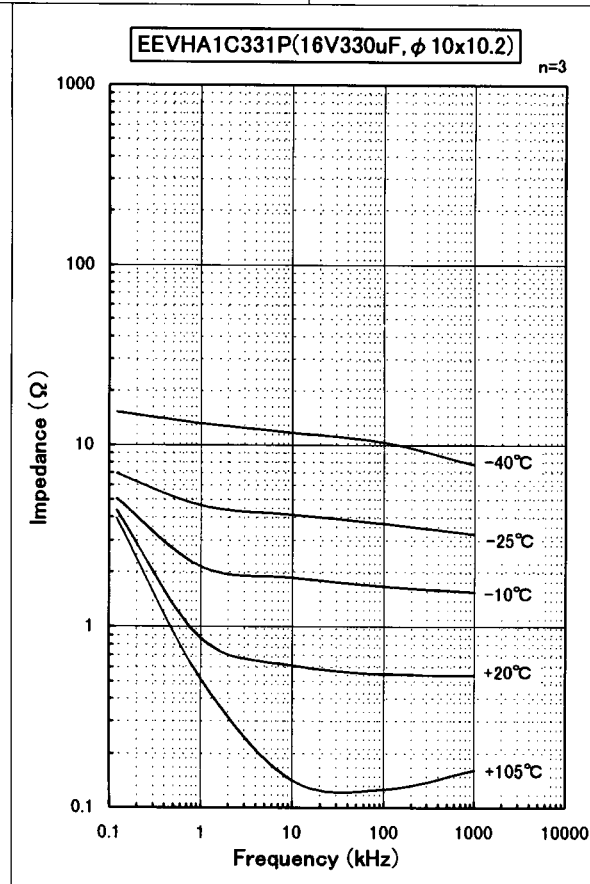
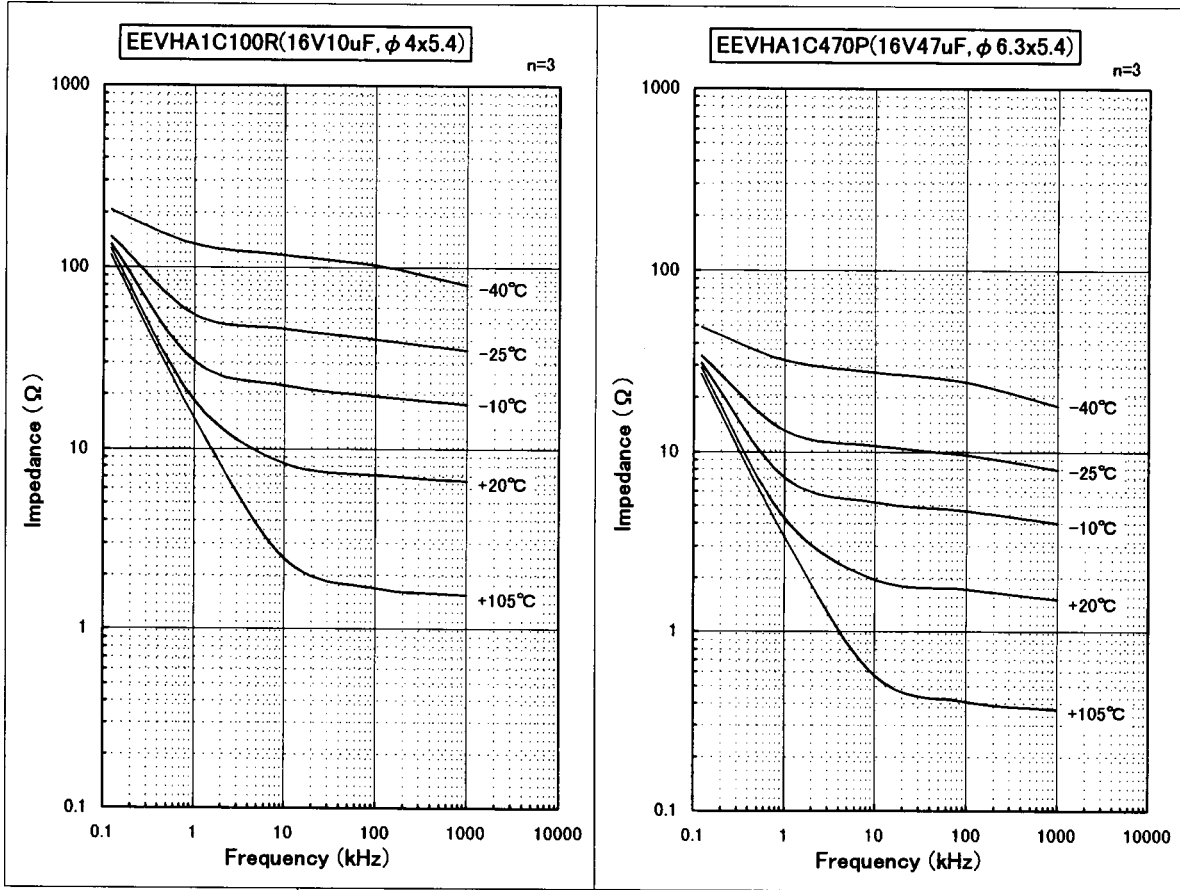
◎ 35WV



◎ 50WV



Temperature Characteristics Data



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