Surface Mount Type

Series: HA Type : V

Country of Origin
Japan
Malaysia

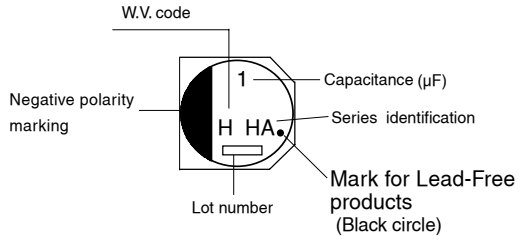
■ Features Endurance: 105°C 1000-2000 h
5.4 mm height (≦ φ6.3)
Vibration-proof product is available upon request.(φ8≦)
RoHS directive compliant

■ Specifications

Category 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	±20,±30 % (120Hz/+20°C)									
DC Leakage Current	I ≦ 0.01 CV or 3(μ A) after 2 minutes (Whichever is greater)									
tan δ	Please see the attached standard products list									
Characteristics at Low Temperature	W.V. (V)	6.3	10	16	25	35	50	63	100	(Impedance ratio 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~D8 sizes, 2000 hours for E~G sizes at +105±2°C and then being stabilized at +20°C, capacitors shall meet the following limits.									
	Capacitance change	±30% of initial measured value E~G case sizes and B~D of 6.3V ±20% of initial measured value for other case sizes								
	tan δ	≦300% of initial measured value E~G case sizes and B~D of 6.3V ≦200% of initial measured value for other case sizes								
	DC leakage current	≦ initial specified value								
Shelf Life	After storage for 1000 hours at +105±2°C with no voltage applied and then being stabilized at +20°C, capacitors shall meet the limits specified in Endurance (With voltage treatment)									
Resistance to Soldering Heat	After reflow soldering and then being stabilized at +20°C, capacitor shall meet the following limits.									
	Capacitance change	±10% of initial measured value								
	tan δ	≦ initial specified value								
	DC leakage current	≦ initial specified value								

■ Marking

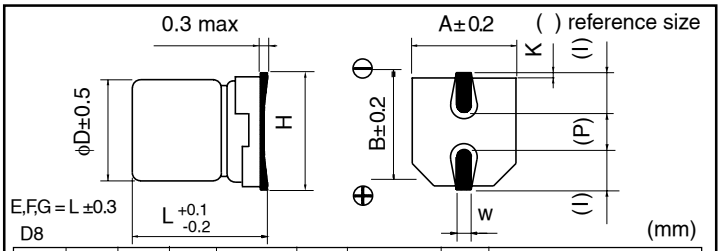
Example:50V 1 μF (Polarized)



W.V. code

V	6.3	10	16	25	35	50	63	100
Code	j	A	C	E	V	H	J	2A

■ Dimensions in mm (not to scale)



Size code	D	L	A,B	H	I	W	P	K
B	4.0	5.4	4.3	5.5MAX	1.8	0.65±0.1	1.0	0.35 -0.20 to +0.15
C	5.0	5.4	5.3	6.5MAX	2.2	0.65±0.1	1.5	0.35 -0.20 to +0.15
D	6.3	5.4	6.6	7.8MAX	2.6	0.65±0.1	1.8	0.35 -0.20 to +0.15
D8	6.3	7.7	6.6	7.8MAX	2.6	0.65±0.1	1.8	0.35 -0.20 to +0.15
E	8.0	6.2	8.3	9.5MAX	3.4	0.65±0.1	2.2	0.35 -0.20 to +0.15
F	8.0	10.2	8.3	10.0MAX	3.4	0.90±0.2	3.1	0.70 ±0.2
G	10.0	10.2	10.3	12.0MAX	3.5	0.90±0.2	4.6	0.70 ±0.2

■ Case size

Cap.(μF) \ W.V.(V)	6.3 (0J)	10 (1A)	16 (1C)	25 (1E)	35 (1V)	50 (1H)	63(1J)	100(2A)
0.1 to 2.2						B		
3.3						B		E
4.7				B	B	C		F(E)
10			B	C(B)	C(B)	D	E	F
22	B	(B)	C(B)	D(C)	D(C)	E	F(E)	G(F)
33	(B)	C(B)	(C)	D(C)	E(D)	(E)F,D8	G	G
47	C(B)	(C)	D(C)	E(D)	F(E)	G(F),D8	G(F)	(G)
100	D(C)	E(D)	(D)	F, D8(E)	G(F),D8	G(F)		
220	(D)	F,D8	G(F),D8	G(F)	G(F)	G		
330	F, D8		G(F)	G(F)	G			
470	(F)	G(F)	G(F)	G				
680			G					
1000	G(F)	G						
1500	G							

■ Standard Products

Endurance: 105°C 1000h-2000h

W.V. (V)	Cap. (±20%) (μF)	Case size Dia. (mm)	Case size Length (mm)	Case size Size Code	Specification Ripple current (120Hz) (+105°C) (mA)	Specification tan δ (120Hz) (+20°C)	Part No. (RoHS:compliant)	Min. Packagng Q'ty Reflow	Min. Packagng Q'ty Taping (pcs)	Endurance (hours)
6.3	22	4	5.4	B	29	0.30	EEEHA0J220R	(1)	2000	1000
	33	4	5.4	B	29	0.35	EEEHA0J330WR	(1)	2000	1000*
	47	4	5.4	B	36	0.35	EEEHA0J470WR	(1)	2000	1000*
		5	5.4	C	46	0.30	EEEHA0J470R	(1)	1000	1000
	100	5	5.4	C	47	0.35	EEEHA0J101WR	(1)	1000	1000*
		6.3	5.4	D	71	0.30	EEEHA0J101P	(1)	1000	1000
	220	6.3	5.4	D	74	0.35	EEEHA0J221WP	(1)	1000	1000*
	330	6.3	7.7	D8	105	0.30	EEEHA0J331XP	(1)	900	1000
		8	10.2	F	230	0.35	EEEHA0J331P	(2)	500	2000*
	470	8	10.2	F	300	0.35	EEEHA0J471UP	(2)	500	2000*
	1000	8	10.2	F	300	0.35	EEEHA0J102UP	(2)	500	2000*
		10	10.2	G	400	0.35	EEEHA0J102P	(2)	500	2000*
	1500	10	10.2	G	480	0.35	EEEHA0J152P	(2)	500	2000*
10	22	4	5.4	B	28	0.30	EEEHA1A220WR	(1)	2000	1000
	33	4	5.4	B	29	0.30	EEEHA1A330WR	(1)	2000	1000
		5	5.4	C	43	0.22	EEEHA1A330R	(1)	1000	1000
	47	5	5.4	C	43	0.30	EEEHA1A470WR	(1)	1000	1000
	100	6.3	5.4	D	71	0.30	EEEHA1A101WP	(1)	1000	1000
		8	6.2	E	110	0.26	EEEHA1A101P	(2)	1000	2000*
	220	6.3	7.7	D8	105	0.22	EEEHA1A221XP	(1)	900	1000
		8	10.2	F	160	0.26	EEEHA1A221P	(2)	500	2000*
	470	8	10.2	F	200	0.26	EEEHA1A471UP	(2)	500	2000*
		10	10.2	G	270	0.26	EEEHA1A471P	(2)	500	2000*
	1000	10	10.2	G	400	0.26	EEEHA1A102P	(2)	500	2000*
16	10	4	5.4	B	28	0.16	EEEHA1C100R	(1)	2000	1000
	22	4	5.4	B	28	0.26	EEEHA1C220WR	(1)	2000	1000
		5	5.4	C	39	0.16	EEEHA1C220R	(1)	1000	1000
	33	5	5.4	C	35	0.26	EEEHA1C330WR	(1)	1000	1000
	47	5	5.4	C	39	0.26	EEEHA1C470WR	(1)	1000	1000
		6.3	5.4	D	70	0.16	EEEHA1C470P	(1)	1000	1000
	100	6.3	5.4	D	70	0.26	EEEHA1C101WP	(1)	1000	1000
	220	6.3	7.7	D8	105	0.16	EEEHA1C221XP	(1)	900	1000
		8	10.2	F	150	0.20	EEEHA1C221UP	(2)	500	2000
		10	10.2	G	210	0.20	EEEHA1C221P	(2)	500	2000
	330	8	10.2	F	170	0.20	EEEHA1C331UP	(2)	500	2000
		10	10.2	G	230	0.20	EEEHA1C331P	(2)	500	2000
	470	8	10.2	F	340	0.20	EEEHA1C471UP	(2)	500	2000
		10	10.2	G	340	0.20	EEEHA1C471P	(2)	500	2000
	680	10	10.2	G	380	0.20	EEEHA1C681P	(2)	500	2000
25	4.7	4	5.4	B	22	0.14	EEEHA1E4R7R	(1)	2000	1000
	10	4	5.4	B	22	0.20	EEEHA1E100WR	(1)	2000	1000
		5	5.4	C	28	0.14	EEEHA1E100R	(1)	1000	1000
	22	5	5.4	C	35	0.20	EEEHA1E220WR	(1)	1000	1000

The taping dimensions are explained on p.195 of our Catalog.
Please use it as a reference guide. Reflow Profile(Fig-1 to Fig-6) listed on last page of our Catalog.
* Endurance capacitance change ±30%, tanδ 300% of initial measured value.

■ Standard Products

Endurance : 105°C 1000h-2000h

W.V. (V)	Cap. (±20%) (μF)	Case size Dia. (mm)	Length (mm)	Size Code	Specification Ripple current (120Hz) (+105°C) (mA)	tan δ (120Hz) (+20°C)	Part No. (RoHS:compliant)	Reflow	Min. Packagng Q'ty Taping (pcs)	Endurance (hours)
25	22	6.3	5.4	D	55	0.14	EEEHA1E220P	(1)	1000	1000
	33	5	5.4	C	45	0.20	EEEHA1E330WR	(1)	1000	1000
		6.3	5.4	D	65	0.14	EEEHA1E330P	(1)	1000	1000
	47	6.3	5.4	D	70	0.20	EEEHA1E470WP	(1)	1000	1000
		8	6.2	E	91	0.16	EEEHA1E470P	(2)	1000	2000*
	100	6.3	7.7	D8	91	0.14	EEEHA1E101XP	(1)	900	1000
		8	6.2	E	91	0.16	EEEHA1E101UP	(2)	1000	2000*
		8	10.2	F	130	0.16	EEEHA1E101P	(2)	500	2000*
	220	8	10.2	F	160	0.16	EEEHA1E221UP	(2)	500	2000*
		10	10.2	G	190	0.16	EEEHA1E221P	(2)	500	2000*
	330	8	10.2	F	180	0.16	EEEHA1E331UP	(2)	500	2000*
		10	10.2	G	340	0.16	EEEHA1E331P	(2)	500	2000*
	470	10	10.2	G	360	0.16	EEEHA1E471P	(2)	500	2000*
35	4.7	4	5.4	B	22	0.12	EEEHA1V4R7R	(1)	2000	1000
	10	4	5.4	B	22	0.16	EEEHA1V100WR	(1)	2000	1000
		5	5.4	C	30	0.12	EEEHA1V100R	(1)	1000	1000
	22	5	5.4	C	35	0.16	EEEHA1V220WR	(1)	1000	1000
		6.3	5.4	D	60	0.12	EEEHA1V220P	(1)	1000	1000
	33	6.3	5.4	D	42	0.16	EEEHA1V330WP	(1)	1000	1000
		8	6.2	E	84	0.14	EEEHA1V330P	(2)	1000	2000*
	47	8	6.2	E	84	0.14	EEEHA1V470UP	(2)	1000	2000*
		8	10.2	F	98	0.14	EEEHA1V470P	(2)	500	2000*
	100	6.3	7.7	D8	84	0.12	EEEHA1V101XP	(1)	900	1000
		8	10.2	F	120	0.14	EEEHA1V101UP	(2)	500	2000*
		10	10.2	G	160	0.14	EEEHA1V101P	(2)	500	2000*
	220	8	10.2	F	170	0.14	EEEHA1V221UP	(2)	500	2000*
		10	10.2	G	210	0.14	EEEHA1V221P	(2)	500	2000*
	330	10	10.2	G	250	0.14	EEEHA1V331P	(2)	500	2000*
50	0.1	4	5.4	B	1	0.12	EEEHA1HR10R	(1)	2000	1000
	0.22	4	5.4	B	2	0.12	EEEHA1HR22R	(1)	2000	1000
	0.33	4	5.4	B	3	0.12	EEEHA1HR33R	(1)	2000	1000
	0.47	4	5.4	B	5	0.12	EEEHA1HR47R	(1)	2000	1000
	1	4	5.4	B	10	0.12	EEEHA1H1R0R	(1)	2000	1000
	2.2	4	5.4	B	16	0.12	EEEHA1H2R2R	(1)	2000	1000
	3.3	4	5.4	B	16	0.12	EEEHA1H3R3R	(1)	2000	1000
	4.7	5	5.4	C	23	0.12	EEEHA1H4R7R	(1)	1000	1000
	10	6.3	5.4	D	35	0.12	EEEHA1H100P	(1)	1000	1000
	22	8	6.2	E	70	0.12	EEEHA1H220P	(2)	1000	2000*
	33	6.3	7.7	D8	70	0.12	EEEHA1H330XP	(1)	900	1000
		8	6.2	E	70	0.12	EEEHA1H330UP	(2)	1000	2000*
		8	10.2	F	91	0.12	EEEHA1H330P	(2)	500	2000*
	47	6.3	7.7	D8	63	0.12	EEEHA1H470XP	(1)	900	1000
		8	10.2	F	95	0.12	EEEHA1H470UP	(2)	500	2000*
		10	10.2	G	100	0.12	EEEHA1H470P	(2)	500	2000*

The taping dimensions are explained on p.195 of our Catalog. Please use it as a reference guide.Reflow Profile(Fig-1 to Fig-6) listed on last page .

* Endurance capacitance change ±30%, tanδ 300% of initial measured value.

■ Standard Products

Endurance : 105°C 1000h-2000h

W.V. (V)	Cap. (±20%) (μF)	Case size Dia. (mm)	Length (mm)	Size Code	Specification Ripple current (120Hz) (+105°C) (mA)	tan δ (120Hz) (+20°C)	Part No. (RoHS:compliant)	Reflow	Min. Packaging Q'ty Taping (pcs)	**Endurance** (hours)
50	100	8	10.2	F	110	0.12	EEEHA1H101UP	(2)	500	2000*
		10	10.2	G	120	0.12	EEEHA1H101P	(2)	500	2000*
	220	10	10.2	G	150	0.12	EEEHA1H221P	(2)	500	2000*
63	10	8	6.2	E	25	0.18	EEEHA1J100P	(2)	1000	2000*
	22	8	6.2	E	25	0.18	EEEHA1J220UP	(2)	1000	2000*
		8	10.2	F	30	0.18	EEEHA1J220P	(2)	500	2000*
	33	10	10.2	G	45	0.18	EEEHA1J330P	(2)	500	2000*
	47	8	10.2	F	45	0.18	EEEHA1J470UP	(2)	500	2000*
		10	10.2	G	50	0.18	EEEHA1J470P	(2)	500	2000*
100	3.3	8	6.2	E	30	0.18	EEEHA2A3R3P	(2)	1000	2000*
	4.7	8	6.2	E	30	0.18	EEEHA2A4R7UP	(2)	1000	2000*
		8	10.2	F	50	0.18	EEEHA2A4R7P	(2)	500	2000*
	10	8	10.2	F	55	0.18	EEEHA2A100P	(2)	500	2000*
	22	8	10.2	F	55	0.18	EEEHA2A220UP	(2)	500	2000*
		10	10.2	G	60	0.18	EEEHA2A220P	(2)	500	2000*
	33	10	10.2	G	65	0.18	EEEHA2A330P	(2)	500	2000*
	47	10	10.2	G	65	0.18	EEEHA2A470UP	(2)	500	2000*

The taping dimensions are explained on p.195 of our Catalog.
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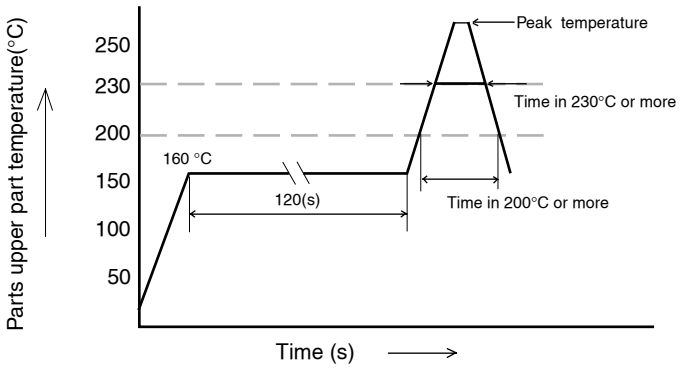
Reflow Profile(Fig-1 to Fig-6) listed on last page of our Catalog.

* Endurance capacitance change ±30%, tanδ 300% of initial measured value.

■ Reflow guaranteed condition

● RoHS compliant



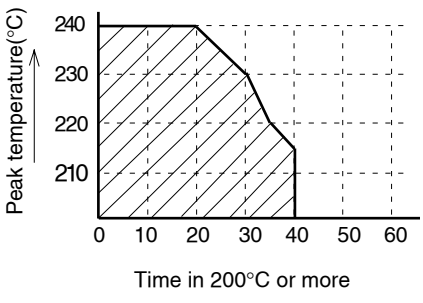
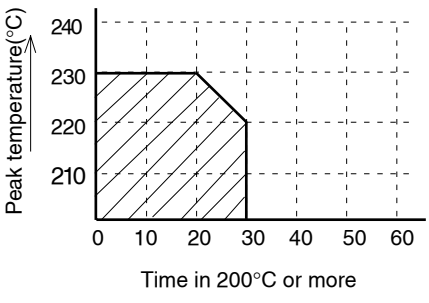
Lead-Free reflow

Reflow No	Fig.(**1**)	Fig.(**2**)	Fig.(**3**)	Fig.(**4**)
Category	φ 3 to φ 6.3	φ 8 to φ 10	φ 12.5 to φ 18	EB series only (φ 10 to φ 18)
Peak temperature	250°C	235°C	230°C (220°C)	230°C
Time in peak temperature	5s	5s	5s (s)	5s
Time in 200°C or more	60s	60s	20s (30s)	20s
Time of reflow	1 time	1 time	1 time	1 time

High temperature Lead-Free reflow

Reflow No	Fig.(**5**)	Fig.(**6**)
Category	φ 4 to φ 6.3	φ 8 to φ 10
Peak temperature	260°C (255°C)	245°C
Time around peak temperature	5s in (10s) in 250°C or more	10s in 240°C or more
Time in 230°C or more	30s	30s
Time in 200°C or more	70s	70s
Time of reflow	2 times	2 times

● RoHS not compliant

Ctegory	Dia. φ3 to φ 6.3 EEV- , ECEV- Part No.	Dia. φ8 to φ 10 EEV- , ECEV- Part No.
Reflow condition	Peak temperature/ Time in 200°C or more  	Peak temperature/ Time in 200°C or more 

❊ For reflow, use athermal condition system such as infrared radiation(IR) or hot blast.
❊ Vapor heat transfer systems(VPS) are not recommended.