

Surface Mount Type

Series: **HA** Type: **V**

■ Features

- Endurance: 105 °C 1000 h
- Vibration-proof product is available upon request.
($\phi 8$ mm and larger)
- AEC-Q200 qualified*
- RoHS directive compliant

■ Specifications

Category Temp. Range	-40 °C to +105 °C									
Rated W.V. Range	6.3 V.DC to 100 V.DC									
Nominal Cap. Range	1 µF to 1500 µF									
Capacitance Tolerance	±20 % (120 Hz/+20 °C)									
DC Leakage Current	I ≤ 0.01 CV or 3 (µA) 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)
	Z(-25 °C)/Z(+20 °C)	4	3	2	2	2	2	3	3	
	Z(-40 °C)/Z(+20 °C)	8	6	4	4	3	3	4	4	
Endurance	After applying rated working voltage for 1000 hours at +105 °C±2 °C and then being stabilized at +20 °C, capacitors shall meet the following limits.									
	Capacitance change	±20 % of initial measured value (6.3 W.V. of miniature : ±30 %)								
	tan δ	≤ 200 % of initial specified value								
	DC leakage current	≤ initial specified value								
Shelf Life	After storage for 1000 hours at +105 °C±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								

■ Frequency correction factor for ripple current

	Frequency (Hz)			
	50, 60	120	1 k	10 k to
Correction factor	0.70	1.00	1.30	1.70

■ Marking

Example: 6.3 V 22 μ F (Polarized)
Marking color : BLACK

Negative polarity marking (-)
Capacitance (μ F)
Series identification
Mark for Lead-Free Products Black Dot (Square)
Rated voltage Mark

Lot number

Rated Voltage Mark

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

■ Dimensions in mm (not to scale)

(Unit : mm)

() Reference size

Size code	D	L	A, B	H	I	W	P	K
B	4.0	$5.4^{+0.1}_{-0.2}$	4.3	5.5 max.	1.8	0.65 ± 0.1	1.0	$0.35^{+0.15}_{-0.20}$
C	5.0	$5.4^{+0.1}_{-0.2}$	5.3	6.5 max.	2.2	0.65 ± 0.1	1.5	$0.35^{+0.15}_{-0.20}$
D	6.3	$5.4^{+0.1}_{-0.2}$	6.6	7.8 max.	2.6	0.65 ± 0.1	1.8	$0.35^{+0.15}_{-0.20}$
D8	6.3	7.7 ± 0.3	6.6	7.8 max.	2.6	0.65 ± 0.1	1.8	$0.35^{+0.15}_{-0.20}$
E	8.0	6.2 ± 0.3	8.3	9.5 max.	3.4	0.65 ± 0.1	2.2	$0.35^{+0.15}_{-0.20}$
F	8.0	10.2 ± 0.3	8.3	10.0 max.	3.4	0.90 ± 0.2	3.1	0.70 ± 0.20
G	10.0	10.2 ± 0.3	10.3	12.0 max.	3.5	0.90 ± 0.2	4.6	0.70 ± 0.20

* This product qualify for AEC-Q200, but it has some deviations.

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.
Should a safety concern arise regarding this product, please be sure to contact us immediately.

02 Mar. 2014

■ Standard Products

Endurance : 105 °C 1000 h

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

* Size code():Miniaturization product

· Please refer to the page of "Reflow Profile" and "The Taping Dimensions".

· When requesting vibration-proof product, please put the last "V" instead to "P"

■ Standard Products

Endurance : 105 °C 1000 h

W.V. (V)	Cap. (±20 %) (μF)	Case size			Specification		Part No. (RoHS:compliant)	Reflow	Min. Packaging Q'ty
		Dia. (mm)	Length (mm)	*Size Code	Ripple Current (120 Hz) (+105°C) (mA r.m.s.)	tan δ (120 Hz) (+20 °C)			Taping (pcs)
25	4.7	4	5.4	B	22	0.14	EEEHA1E4R7R	(1)	2000
	10	4	5.4	(B)	22	0.20	EEEHA1E100WR	(1)	2000
		5	5.4	C	28	0.14	EEEHA1E100R	(1)	1000
	22	5	5.4	(C)	35	0.20	EEEHA1E220WR	(1)	1000
		6.3	5.4	D	55	0.14	EEEHA1E220P	(1)	1000
	33	5	5.4	(C)	45	0.20	EEEHA1E330WR	(1)	1000
		6.3	5.4	D	65	0.14	EEEHA1E330P	(1)	1000
	47	6.3	5.4	(D)	70	0.20	EEEHA1E470WP	(1)	1000
		8	6.2	E	91	0.16	EEEHA1E470P	(2)	1000
	100	6.3	7.7	D8	91	0.14	EEEHA1E101XP	(1)	900
		8	6.2	(E)	91	0.16	EEEHA1E101UP	(2)	1000
		8	10.2	F	130	0.16	EEEHA1E101P	(2)	500
	220	8	10.2	(F)	160	0.16	EEEHA1E221UP	(2)	500
		10	10.2	G	190	0.16	EEEHA1E221P	(2)	500
	330	8	10.2	(F)	180	0.16	EEEHA1E331UP	(2)	500
		10	10.2	G	340	0.16	EEEHA1E331P	(2)	500
	470	10	10.2	G	360	0.16	EEEHA1E471P	(2)	500
35	4.7	4	5.4	B	22	0.12	EEEHA1V4R7R	(1)	2000
	10	4	5.4	(B)	22	0.16	EEEHA1V100WR	(1)	2000
		5	5.4	C	30	0.12	EEEHA1V100R	(1)	1000
	22	5	5.4	(C)	35	0.16	EEEHA1V220WR	(1)	1000
		6.3	5.4	D	60	0.12	EEEHA1V220P	(1)	1000
	33	6.3	5.4	(D)	42	0.16	EEEHA1V330WP	(1)	1000
		8	6.2	E	84	0.14	EEEHA1V330P	(2)	1000
	47	8	6.2	(E)	84	0.14	EEEHA1V470UP	(2)	1000
		8	10.2	F	98	0.14	EEEHA1V470P	(2)	500
	100	6.3	7.7	D8	84	0.12	EEEHA1V101XP	(1)	900
		8	10.2	(F)	120	0.14	EEEHA1V101UP	(2)	500
		10	10.2	G	160	0.14	EEEHA1V101P	(2)	500
	220	8	10.2	(F)	170	0.14	EEEHA1V221UP	(2)	500
		10	10.2	G	210	0.14	EEEHA1V221P	(2)	500
	330	10	10.2	G	250	0.14	EEEHA1V331P	(2)	500
50	0.1	4	5.4	B	1	0.12	EEEHA1HR10R ***	(1)	2000
	0.22	4	5.4	B	2	0.12	EEEHA1HR22R ***	(1)	2000
	0.33	4	5.4	B	3	0.12	EEEHA1HR33R ***	(1)	2000
	0.47	4	5.4	B	5	0.12	EEEHA1HR47R ***	(1)	2000
	1	4	5.4	B	10	0.12	EEEHA1H1R0R	(1)	2000
	2.2	4	5.4	B	16	0.12	EEEHA1H2R2R	(1)	2000
	3.3	4	5.4	B	16	0.12	EEEHA1H3R3R	(1)	2000
	4.7	5	5.4	C	23	0.12	EEEHA1H4R7R	(1)	1000
	10	6.3	5.4	D	35	0.12	EEEHA1H100P	(1)	1000
	22	8	6.2	E	70	0.12	EEEHA1H220P	(2)	1000
	33	6.3	7.7	D8	70	0.12	EEEHA1H330XP	(1)	900
		8	6.2	(E)	70	0.12	EEEHA1H330UP	(2)	1000
		8	10.2	F	91	0.12	EEEHA1H330P	(2)	500
	47	6.3	7.7	D8	63	0.12	EEEHA1H470XP	(1)	900
		8	10.2	(F)	95	0.12	EEEHA1H470UP	(2)	500
		10	10.2	G	100	0.12	EEEHA1H470P	(2)	500
	100	8	10.2	(F)	110	0.12	EEEHA1H101UP	(2)	500
		10	10.2	G	120	0.12	EEEHA1H101P	(2)	500
	220	10	10.2	G	150	0.12	EEEHA1H221P	(2)	500

* Size code():Miniaturization product

*** Please kindly accept last shipment : 31/Mar/2015

· Please refer to the page of "Reflow Profile" and "The Taping Dimensions".

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02 Mar. 2014

■ Standard Products

Endurance : 105 °C 1000 h

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

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