Surface Mount Type

Series: **S** Type: **V**

■ Features

- Endurance: 85 °C 2000 h
- Vibration-proof product is available upon request. (ϕ8 mm and larger)
- RoHS directive compliant

■ Specifications

Category Temp. Range	−40 °C to +85 °C										
Rated W.V. Range	4 V.DC to 100 V.DC										
Nominal Cap. Range	0.1 µF to 1500 µF										
Capacitance Tolerance	±20 % (120 Hz/+20 °C)										
DC Leakage Current	I ≦ 0.01 CV or 3 (µA) (Bi-Polar I ≦ 0.02 CV or 6 (µA) After 2 minutes (Whichever is greater)										
tan δ	Please see the attached standard products list										
Characteristics at Low Temperature	W.V. (V)	4	6.3	10	16	25	35	50	63	100	(Impedance ratio at 120 Hz)
	Z(−25 °C)/Z(+20 °C)	7	4	3	2	2	2	2	3	3	
	Z(−40 °C)/Z(+20 °C)	15	8	6	4	4	3	3	4	4	

Endurance

After applying rated working voltage for 2000 hours (Bi-polar:1000 hours for each polarity) at +85 °C ±2 °C and then being stabilized at +20 °C, Capacitors shall meet the following limits.

Capacitance change	±20 % of inisial measured value		
	Size code	Rated W.V.	Cap. change
	A(ϕ3)	4 W.V to 50 W.V	1000 hours ±30 %
	B(ϕ4) to D, D8(ϕ6.3)	4 W.V	
	≦ D(ϕ6.3) Miniature	6.3 W.V	
		≧ 10 W.V	1000 hours ±20 %
tan δ	≦ 200 % initial specified value		
DC leakege current	≦ initial specified value		

Shelf Life

After storage for 1000 hours at +85 °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, capacitors shall meet the following limits.

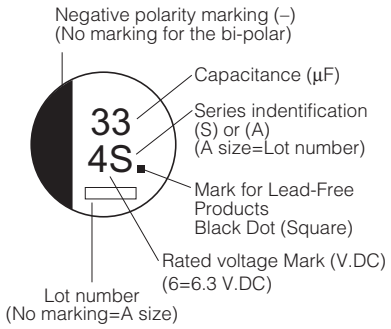
Capacitance change	±10 % of initial measured value
tan δ	≦ initial specified value
DC leakage current	≦ initial specified value

■ 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

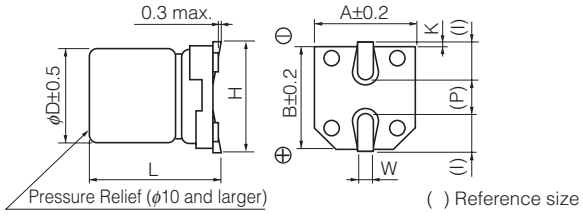
■ Marking

Example:4V 33 µF (Polarized)
Marking color: BLACK



■ Dimensions in mm (not to scale)

(Unit : mm)



Size code	D	L	A, B	H	I	W	P	K
A	3.0	$5.4^{+0.1}_{-0.2}$	3.3	4.5 max.	1.5	0.55±0.1	0.6	$0.35^{+0.15}_{-0.20}$
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

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00 Nov. 2012

■ Standard Products

Endurance : 85 °C 2000 h

W.V. (V)	Cap. (±20 %) (μF)	Case size Dia. (mm)	Length (mm)	✻Size Code	Specification Ripple Current (120 Hz) (+85 °C) (mA r.m.s.)	tan δ (120 Hz) (+20 °C)	Endurance (hours)	Part No. (RoHS:compliant)	Reflow	Min. Packaging Q'ty Taping (pcs)
4	22	3	5.4	A	19	0.37	1000	EEE0GS220SR ✻✻	(1)	2000
	33	4	5.4	B	26	0.35	1000	EEE0GA330SR	(1)	2000
	47	4	5.4	B	34	0.35	1000	EEE0GA470SR	(1)	2000
	100	5	5.4	C	61	0.35	1000	EEE0GA101SR	(1)	1000
	220	6.3	5.4	D	82	0.35	1000	EEE0GA221SP	(1)	1000
	330	6.3	5.4	(D)	80	0.50	1000	EEE0GA331WP	(1)	1000
	470	6.3	7.7	D8	200	0.35	1000	EEE0GA471XP	(1)	900
6.3	22	3	5.4	(A)	20	0.35	1000	EEE0JS220WR ✻✻	(1)	2000
		4	5.4	B	29	0.26	2000	EEE0JA220SR	(1)	2000
	33	4	5.4	(B)	22	0.35	1000	EEE0JA330WR	(1)	2000
	47	4	5.4	(B)	36	0.35	1000	EEE0JA470WR	(1)	2000
		5	5.4	C	46	0.26	2000	EEE0JA470SR	(1)	1000
	100	5	5.4	(C)	47	0.35	1000	EEE0JA101WR	(1)	1000
		6.3	5.4	D	71	0.26	2000	EEE0JA101SP	(1)	1000
	220	6.3	5.4	(D)	74	0.35	1000	EEE0JA221WP	(1)	1000
	330	6.3	7.7	D8	188	0.26	2000	EEE0JA331XP	(1)	900
		8	6.2	E	300	0.35	2000	EEE0JA331P	(2)	1000
	470	8	10.2	F	380	0.35	2000	EEE0JA471P	(2)	500
	1000	8	10.2	(F)	500	0.35	2000	EEE0JA102UP	(2)	500
		10	10.2	G	700	0.35	2000	EEE0JA102P	(2)	500
	1500	10	10.2	G	750	0.35	2000	EEE0JA152P	(2)	500
10	22	4	5.4	(B)	28	0.30	1000	EEE1AA220WR	(1)	2000
	33	4	5.4	(B)	29	0.30	1000	EEE1AA330WR	(1)	2000
		5	5.4	C	43	0.20	2000	EEE1AA330SR	(1)	1000
	47	5	5.4	(C)	43	0.30	1000	EEE1AA470WR	(1)	1000
	100	5	5.4	(C)	50	0.30	1000	EEE1AA101WR	(1)	1000
		6.3	5.4	D	70	0.26	2000	EEE1AA101SP	(1)	1000
	220	6.3	7.7	D8	173	0.20	2000	EEE1AA221XP	(1)	900
		8	6.2	E	250	0.26	2000	EEE1AA221P	(2)	1000
	330	8	10.2	F	390	0.26	2000	EEE1AA331P	(2)	500
	470	8	10.2	(F)	390	0.26	2000	EEE1AA471UP	(2)	500
		10	10.2	G	400	0.26	2000	EEE1AA471P	(2)	500
	1000	10	10.2	G	580	0.26	2000	EEE1AA102P	(2)	500
16	10	3	5.4	A	20	0.18	1000	EEE1CS100SR ✻✻	(1)	2000
		4	5.4	B	28	0.16	2000	EEE1CA100SR	(1)	2000
	22	4	5.4	(B)	28	0.26	1000	EEE1CA220WR	(1)	2000
		5	5.4	C	39	0.16	2000	EEE1CA220SR	(1)	1000
	33	5	5.4	(C)	35	0.26	1000	EEE1CA330WR	(1)	1000
	47	5	5.4	(C)	39	0.26	1000	EEE1CA470WR	(1)	1000
		6.3	5.4	D	70	0.16	2000	EEE1CA470SP	(1)	1000
	100	6.3	5.4	(D)	70	0.26	1000	EEE1CA101WP	(1)	1000
		8	6.2	E	200	0.20	2000	EEE1CA101P	(2)	1000
	220	6.3	7.7	D8	162	0.16	2000	EEE1CA221XP	(1)	900
		8	10.2	F	280	0.20	2000	EEE1CA221P	(2)	500
	330	8	10.2	(F)	320	0.20	2000	EEE1CA331UP	(2)	500
		10	10.2	G	380	0.20	2000	EEE1CA331P	(2)	500
	470	8	10.2	(F)	350	0.20	2000	EEE1CA471UP	(2)	500
		10	10.2	G	420	0.20	2000	EEE1CA471P	(2)	500

✻ Size code( ):Miniaturization product

✻✻ Dia.3mm is not recommended for new design. Please consider Dia.4mm.(Available upon request)

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■ Standard Products

Endurance : 85 °C 2000 h

W.V. (V)	Cap. (±20 %) (μF)	Case size Dia. (mm)	Length (mm)	✻Size Code	Specification Ripple Current (120 Hz) (+85 °C) (mA r.m.s.)	tan δ (120 Hz) (+20 °C)	Endurance (hours)	Part No. (RoHS:compliant)	Reflow	Min. Packaging Q'ty Taping (pcs)
25	4.7	3	5.4	A	12	0.16	1000	EEE1ES4R7SR ✻✻	(1)	2000
		4	5.4	B	22	0.14	2000	EEE1EA4R7SR	(1)	2000
	10	4	5.4	(B)	22	0.20	1000	EEE1EA100WR	(1)	2000
		5	5.4	C	28	0.14	2000	EEE1EA100SR	(1)	1000
	22	5	5.4	(C)	35	0.20	1000	EEE1EA220WR	(1)	1000
		6.3	5.4	D	55	0.14	2000	EEE1EA220SP	(1)	1000
	33	5	5.4	(C)	42	0.20	1000	EEE1EA330WR	(1)	1000
		6.3	5.4	D	65	0.14	2000	EEE1EA330SP	(1)	1000
	47	6.3	5.4	(D)	70	0.20	1000	EEE1EA470WP	(1)	1000
	100	6.3	7.7	D8	143	0.14	2000	EEE1EA101XP	(1)	900
		8	6.2	(E)	91	0.16	2000	EEE1EA101UP	(2)	1000
		8	10.2	F	180	0.16	2000	EEE1EA101P	(2)	500
	220	8	10.2	(F)	230	0.16	2000	EEE1EA221UP	(2)	500
		10.0	10.2	G	310	0.16	2000	EEE1EA221P	(2)	500
	330	8	10.2	(F)	270	0.16	2000	EEE1EA331UP	(2)	500
		10	10.2	G	340	0.16	2000	EEE1EA331P	(2)	500
	470	10	10.2	G	380	0.16	2000	EEE1EA471P	(2)	500
35	2.2	3	5.4	A	8	0.14	1000	EEE1VS2R2SR ✻✻	(1)	2000
	3.3	3	5.4	A	10	0.14	1000	EEE1VS3R3SR ✻✻	(1)	2000
	4.7	4	5.4	B	22	0.12	2000	EEE1VA4R7SR	(1)	2000
	10	4	5.4	(B)	22	0.16	1000	EEE1VA100WR	(1)	2000
		5	5.4	C	30	0.12	2000	EEE1VA100SR	(1)	1000
	22	5	5.4	(C)	36	0.16	1000	EEE1VA220WR	(1)	1000
		6.3	5.4	D	60	0.12	2000	EEE1VA220SP	(1)	1000
	33	6.3	5.4	(D)	60	0.16	1000	EEE1VA330WP	(1)	1000
		8	6.2	E	130	0.14	2000	EEE1VA330P	(2)	1000
	47	6.3	5.4	(D)	70	0.16	1000	EEE1VA470WP	(1)	1000
		8	6.2	E	165	0.14	2000	EEE1VA470P	(2)	1000
	100	6.3	7.7	D8	132	0.12	2000	EEE1VA101XP	(1)	900
		8	10.2	(F)	140	0.14	2000	EEE1VA101UP	(2)	500
		10	10.2	G	210	0.14	2000	EEE1VA101P	(2)	500
	220	8	10.2	(F)	200	0.14	2000	EEE1VA221UP	(2)	500
		10	10.2	G	310	0.14	2000	EEE1VA221P	(2)	500
	330	10	10.2	G	350	0.14	2000	EEE1VA331P	(2)	500

✻ Size code( ):Miniaturization product

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■ Standard Products

Endurance : 85 °C 2000 h

W.V. (V)	Cap. (±20 %) (μF)	Case size Dia. (mm)	Length (mm)	✻Size Code	Specification Ripple Current (120 Hz) (+85 °C) (mA r.m.s.)	tan δ (120 Hz) (+20 °C)	Endurance (hours)	Part No. (RoHS:compliant)	Reflow	Min. Packaging Q'ty Taping (pcs)
50	0.1	3	5.4	A	1	0.14	1000	EEE1HS0R1SR ✻✻	(1)	2000
		4	5.4	B	1	0.12	2000	EEE1HA0R1SR	(1)	2000
	0.22	3	5.4	A	2	0.14	1000	EEE1HSR22SR ✻✻	(1)	2000
		4	5.4	B	2	0.12	2000	EEE1HAR22SR	(1)	2000
	0.33	3	5.4	A	3	0.14	1000	EEE1HSR33SR ✻✻	(1)	2000
		4	5.4	B	3	0.12	2000	EEE1HAR33SR	(1)	2000
	0.47	3	5.4	A	5	0.14	1000	EEE1HSR47SR ✻✻	(1)	2000
		4	5.4	B	5	0.12	2000	EEE1HAR47SR	(1)	2000
	1	3	5.4	A	8	0.14	1000	EEE1HS010SR ✻✻	(1)	2000
		4	5.4	B	10	0.12	2000	EEE1HA010SR	(1)	2000
	2.2	3	5.4	A	8	0.14	1000	EEE1HS2R2SR ✻✻	(1)	2000
		4	5.4	B	16	0.12	2000	EEE1HA2R2SR	(1)	2000
	3.3	4	5.4	B	16	0.12	2000	EEE1HA3R3SR	(1)	2000
	4.7	4	5.4	(B)	18	0.14	1000	EEE1HA4R7WR	(1)	2000
		5	5.4	C	23	0.12	2000	EEE1HA4R7SR	(1)	1000
	10	5	5.4	(C)	27	0.14	1000	EEE1HA100WR	(1)	1000
		6.3	5.4	D	35	0.12	2000	EEE1HA100SP	(1)	1000
	22	6.3	5.4	(D)	40	0.14	1000	EEE1HA220WP	(1)	1000
		8	6.2	E	120	0.12	2000	EEE1HA220P	(2)	1000
	33	6.3	7.7	D8	85	0.12	2000	EEE1HA330XP	(1)	900
		8	6.2	(E)	65	0.12	2000	EEE1HA330UP	(2)	1000
		8	10.2	F	110	0.12	2000	EEE1HA330P	(2)	500
	47	6.3	7.7	D8	105	0.12	2000	EEE1HA470XP	(1)	900
		8	10.2	(F)	110	0.12	2000	EEE1HA470UP	(2)	500
		10	10.2	G	130	0.12	2000	EEE1HA470P	(2)	500
	100	8	10.2	(F)	200	0.12	2000	EEE1HA101UP	(2)	500
		10	10.2	G	250	0.12	2000	EEE1HA101P	(2)	500
	220	10	10.2	G	300	0.12	2000	EEE1HA221P	(2)	500
63	22	8	6.2	(E)	40	0.18	2000	EEE1JA220UP	(2)	1000
		8	10.2	F	40	0.18	2000	EEE1JA220P	(2)	500
	33	8	10.2	F	45	0.18	2000	EEE1JA330P	(2)	500
	47	8	10.2	(F)	45	0.18	2000	EEE1JA470UP	(2)	500
		10	10.2	G	45	0.18	2000	EEE1JA470P	(2)	500
	100	10	10.2	G	60	0.18	2000	EEE1JA101P	(2)	500
100	3.3	8	6.2	E	50	0.18	2000	EEE2AA3R3P	(2)	1000
	4.7	8	6.2	(E)	50	0.18	2000	EEE2AA4R7UP	(2)	1000
		8	10.2	F	80	0.18	2000	EEE2AA4R7P	(2)	500
	10	8	6.2	(E)	50	0.18	2000	EEE2AA100UP	(2)	1000
		8	10.2	F	85	0.18	2000	EEE2AA100P	(2)	500
	22	8	10.2	(F)	55	0.18	2000	EEE2AA220UP	(2)	500
		10	10.2	G	85	0.18	2000	EEE2AA220P	(2)	500
	33	10	10.2	G	90	0.18	2000	EEE2AA330P	(2)	500

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■ Standard Products (Bi-polar)

Endurance : 85 °C 2000 h

W.V. (V)	Cap. (±20 %) (μF)	Case size Dia. (mm)	Length (mm)	Size Code	Specification Ripple Current (120 Hz) (+85 °C) (mA r.m.s.)	tan δ (120 Hz) (+20 °C)	Endurance (hours)	Part No. (RoHS:compliant)	Reflow	Min. Packaging Q'ty Taping (pcs)
6.3	22	5	5.4	C	29	0.52	2000	EEE0JA220NR	(1)	1000
	47	6.3	5.4	D	46	0.52	2000	EEE0JA470NP	(1)	1000
10	10	4	5.4	B	25	0.40	2000	EEE1AA100NR	(1)	2000
	33	6.3	5.4	D	43	0.40	2000	EEE1AA330NP	(1)	1000
16	4.7	4	5.4	B	20	0.32	2000	EEE1CA4R7NR	(1)	2000
	10	5	5.4	C	25	0.32	2000	EEE1CA100NR	(1)	1000
	22	6.3	5.4	D	39	0.32	2000	EEE1CA220NP	(1)	1000
25	3.3	4	5.4	B	12	0.28	2000	EEE1EA3R3NR	(1)	2000
	4.7	5	5.4	C	21	0.28	2000	EEE1EA4R7NR	(1)	1000
	10	6.3	5.4	D	28	0.28	2000	EEE1EA100NP	(1)	1000
35	2.2	4	5.4	B	12	0.24	2000	EEE1VA2R2NR	(1)	2000
	4.7	5	5.4	C	22	0.24	2000	EEE1VA4R7NR	(1)	1000
	10	6.3	5.4	D	30	0.24	2000	EEE1VA100NP	(1)	1000
50	0.22	4	5.4	B	2	0.24	2000	EEE1HAR22NR	(1)	2000
	0.33	4	5.4	B	3	0.24	2000	EEE1HAR33NR	(1)	2000
	0.47	4	5.4	B	5	0.24	2000	EEE1HAR47NR	(1)	2000
	1	4	5.4	B	10	0.24	2000	EEE1HA010NR	(1)	2000
	2.2	5	5.4	C	16	0.24	2000	EEE1HA2R2NR	(1)	1000
	3.3	5	5.4	C	21	0.24	2000	EEENZ1H3R3R	(1)	1000
	4.7	6.3	5.4	D	31	0.24	2000	EEE1HA4R7NP	(1)	1000

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