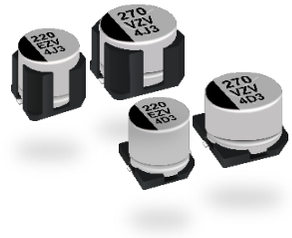
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Panasonic INDUSTRY

Hybrid



Conductive Polymer Hybrid Aluminum Electrolytic Capacitors

Surface Mount Type

ZV series **High temperature lead-free reflow**

Features

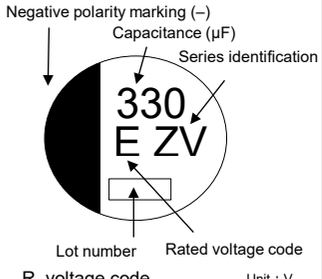
- Endurance: 4000 h at 125 °C / 135 °C
- Low ESR (up to 39 %, Lower ESR than Current ZT series)
- Higher ripple current (max 150 % of ZT series)
- AEC-Q200 compliant
- RoHS compliant

Specifications

Size code	F	G
Category temp. range	–55 °C to +135 °C	
Rated voltage range	25 V to 63 V	
Nominal capacitance range	33 µF to 220 µF	56 µF to 330 µF
Capacitance tolerance	±20 % (120 Hz / +20 ℃)	
Leakage current	I ≦ 0.01 CV (µA), 2 minutes after reaching rated voltage, 20 ℃ *CV = (Capacitance in µF) x (Rated voltage in V)	
Dissipation factor (tan δ)	Please see the attached characteristics list	
Surge voltage (V)	Rated voltage × 1.25 (15 ℃ to 35 ℃)	
Endurance 1	+125 ℃ ± 2 ℃, 4000 h, apply the rated ripple current without exceeding the rated voltage	
Capacitance change	Within ±30% of the initial value	
Dissipation factor (tan δ)	≦ 200 % of the initial limit	
E.S.R.	≦ 200 % of the initial limit	
Leakage current	Within the initial limit	
ESR after endurance (Ω / 100 kHz)(-40 ℃)	Size code F: 0.4	Size code G: 0.3
Endurance 2	+135 °C ± 2 °C, 4000 h, apply the rated ripple current without exceeding the rated voltage	
Capacitance change	Within ±30% of the initial value	
Dissipation factor (tan δ)	≦ 200 % of the initial limit	
E.S.R.	≦ 200 % of the initial limit	
Leakage current	Within the initial limit	
ESR after endurance (Ω / 100 kHz)(-40 ℃)	Size code F: 0.4	Size code G: 0.3
Shelf life	After storage for 1000 hours at +135 °C ± 2 °C with no voltage applied and then being stabilized at +20 ℃, capacitors shall meet the limits specified in endurance. (With voltage treatment)	
Damp heat (Load)	85 ℃ ± 2 ℃, 85 % to 90 %RH, 2000 h, rated voltage applied	
Capacitance change	Within ±30% of the initial value	
Dissipation factor (tan δ)	≦ 200 % of the initial limit	
E.S.R.	≦ 200 % of the initial limit	
Leakage current	Within the initial limit	
Resistance to soldering heat	After reflow soldering and then being stabilized at +20 ℃, capacitors shall meet the following limits.	
Capacitance change	Within ±10% of the initial value	
Dissipation factor (tan δ)	Within the initial limit	
Leakage current	Within the initial limit	

Marking

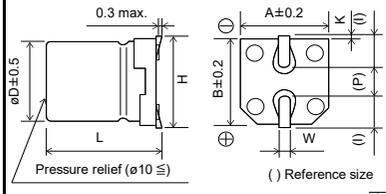
Example : 25 V 330 µF
Marking color : BLACK



R. voltage code	Unit : V
E	25
V	35
H	50
J	63

Dimensions (not to scale)

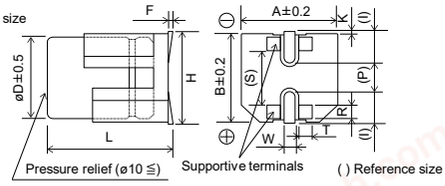
[Standard]



Unit : mm

Size code	øD	L	A, B	H max.	I	W	P	K
F	8.0	10.2±0.3	8.3	10.0	3.4	0.90±0.2	3.1	0.70±0.2
G	10.0	10.2±0.3	10.3	12.0	3.5	0.90±0.2	4.6	0.70±0.2

[Vibration-proof product]



Unit : mm

Size code	øD	L	A, B	H max.	F	I	W	P	K	R	S	T
F	8.0	10.5±0.3	8.3	10.0	0 to +0.15	3.4	1.2±0.2	3.1	0.70±0.2	0.70±0.2	5.3	1.3±0.2
G	10.0	10.5±0.3	10.3	12.0	0 to +0.15	3.5	1.2±0.2	4.6	0.70±0.2	0.70±0.2	6.9	1.3±0.2

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.

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Explanation of part numbers

◇ Part number system

e.g.: EEHZV1E221P

EEH	ZV	1E	221	P
Product classification				

Series	Code
ZV	ZV

Rated voltage (V)	Code*
25	1E
35	1V
50	1H
63	1J

Capacitance (μF)	Code	Capacitance (μF)	Code
33	330	120	121
47	470	150	151
56	560	220	221
68	680	270	271
82	820	330	331
100	101		

Tape width (mm)	Code
16 to 24	P

Replace for the following configuration

Configuration	Code
Vibration proof	V

*: If the total figures number of the part number exceeds 12 figures, "1" is omitted.

Characteristics list

Endurance 1 : 125 ℃ 4000 h

Endurance 2 : 135 °C 4000 h

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm) øD	Case size (mm) L Standard	Case size (mm) L Vibration-proof	Size code	Specification Ripple current *1 (mA rms) Endurance 1 (+125℃)	Specification Ripple current *1 (mA rms) Endurance 2 (+135℃)	Specification ESR*2 (mΩ)	Specification tan δ*3	Part number Standard product	Part number Vibration-proof product	Min. packaging q'ty (pcs) Taping
25	220	8.0	10.2	10.5	F	3900	2900	16	0.14	EEHZV1E221P	EEHZV1E221V	500
	330	10.0	10.2	10.5	G	4600	3400	12	0.14	EEHZV1E331P	EEHZV1E331V	500
35	150	8.0	10.2	10.5	F	3900	2900	16	0.12	EEHZV1V151P	EEHZV1V151V	500
	270	10.0	10.2	10.5	G	4600	3400	12	0.12	EEHZV1V271P	EEHZV1V271V	500
50	68	8.0	10.2	10.5	F	3600	2500	19	0.10	EEHZV1H680P	EEHZV1H680V	500
	100	10.0	10.2	10.5	G	4300	3200	15	0.10	EEHZV1H101P	EEHZV1H101V	500
	120	10.0	10.2	10.5	G	4300	3200	15	0.10	EEHZV1H121P	EEHZV1H121V	500
63	33	8.0	10.2	10.5	F	3300	2300	22	0.08	EEHZV1J330P	EEHZV1J330V	500
	47	8.0	10.2	10.5	F	3300	2300	22	0.08	EEHZV1J470P	EEHZV1J470V	500
	56	10.0	10.2	10.5	G	4000	3000	17	0.08	EEHZV1J560P	EEHZV1J560V	500
	68	10.0	10.2	10.5	G	4000	3000	17	0.08	EEHZV1J680P	EEHZV1J680V	500
	82	10.0	10.2	10.5	G	4000	3000	17	0.08	EEHZV1J820P	EEHZV1J820V	500

*1: Ripple current (100 kHz / +125 °C or +135 °C)

*2: ESR (100 kHz / +20 ℃)

*3: tan δ (120 Hz / +20 ℃)

◆ Please refer to the page of “Reflow profile” and “The taping dimensions”.

◆ The dimensions of the vibration-proof products, please refer to the page of the mounting specification.

Frequency correction factor for ripple current

Rated capacitance (C)	Frequency (f)	100 Hz ≦ f < 200 Hz	200 Hz ≦ f < 300 Hz	300 Hz ≦ f < 500 Hz	500 Hz ≦ f < 1 kHz
C < 47 μF	Correction factor	0.10	0.10	0.15	0.20
47 μF ≦ C < 150 μF		0.15	0.20	0.25	0.30
150 μF ≦ C		0.15	0.25	0.25	0.30

Rated capacitance (C)	Frequency (f)	1 kHz ≦ f < 2 kHz	2 kHz ≦ f < 3 kHz	3 kHz ≦ f < 5 kHz	5 kHz ≦ f < 10 kHz
C < 47 μF	Correction factor	0.30	0.40	0.45	0.50
47 μF ≦ C < 150 μF		0.40	0.45	0.55	0.60
150 μF ≦ C		0.45	0.50	0.60	0.65

Rated capacitance (C)	Frequency (f)	10 kHz ≦ f < 15 kHz	15 kHz ≦ f < 20 kHz	20 kHz ≦ f < 30 kHz	30 kHz ≦ f < 40 kHz
C < 47 μF	Correction factor	0.60	0.65	0.70	0.75
47 μF ≦ C < 150 μF		0.70	0.75	0.80	0.80
150 μF ≦ C		0.75	0.80	0.85	0.85

Rated capacitance (C)	Frequency (f)	40 kHz ≦ f < 50 kHz	50 kHz ≦ f < 100 kHz	100 kHz ≦ f < 500 kHz	500 kHz ≦ f < 1000 kHz
C < 47 μF	Correction factor	0.80	0.85	1.00	1.05
47 μF ≦ C < 150 μF		0.85	0.90	1.00	1.00
150 μF ≦ C		0.85	0.90	1.00	1.00

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