Surface Mount Type

Series: HD Type : V

■ Features Endurance: 5000h at 105°C
Vibration-proof product is available upon request.(φ8 ≦)
RoHS directive not compliant

■ Specifications

Category temp. range	-40 to +105°C
Rated W.V. Range	10 to 100V .DC
Nominal Cap. Range	0.47 to 330 μ F
Capacitance Tolerance	±20 % (120Hz/+20°C)
DC Leakage Current	I ≦0.01CV or 3(μA) After 2 minutes application of rated working voltage at +20°C. (Whichever is greater)
tan δ	Please see the attached standard products list

Characteristics at Low Temperature

W.V. (V)	10	16	25	35	50	63	100
Z(-25°C) / Z(+20°C)	8	5	4	3	3	3	3
Z(-40°C)/ Z(+20°C)	14	12	10	8	8	8	8

(Impedance ratio at 120 Hz)

Endurance

After applying rated working voltage for 5000 hours at +105±2°C and then being stabilized at +20°C, capacitors shall meet the following limits.

Capacitance change	±30% of initial measured value
tan δ	≦300 % of initial specified value
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)

Capacitance change	±20% of initial measured value
tan δ	≦200 % of initial specified value
DC leakage current	≦initial specified value

Resistance to Soldering Heat

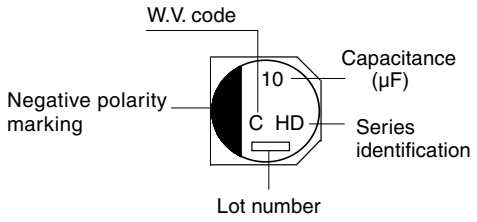
After reflow soldering (Refer to page 86 for recommended temperature profile.) and then being stabilized at +20°C, capacitor shall meet the following limits.

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

■ Marking

Example.16V10μF

Marking color : BLACK

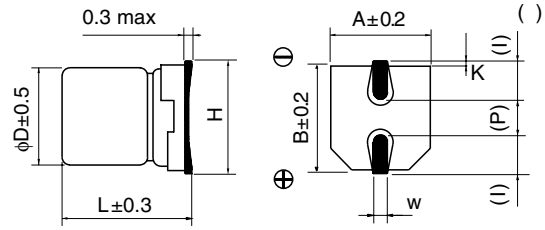


W.V. code

V	10	16	25	35
Code	A	C	E	V

V	50	63	100
Code	H	J	2A

■ Dimensions in mm (not to scale)



Size code	D	L	A,B	H max.	I	W	P	K
B	4.0	5.8	4.3	5.5	1.8	0.65±0.1	1.0	0.35 -0.20 to +0.15
C	5.0	5.8	5.3	6.5	2.2	0.65±0.1	1.5	0.35 -0.20 to +0.15
D	6.3	5.8	6.6	7.8	2.6	0.65±0.1	1.8	0.35 -0.20 to +0.15
E	8.0	6.2	8.3	9.5	3.4	0.65±0.1	2.2	0.35 -0.20 to +0.15
F	8.0	10.2	8.3	10.0	3.4	0.90±0.2	3.1	0.70 ±0.20
G	10.0	10.2	10.3	12.0	3.5	0.90±0.2	4.6	0.70 ±0.20

■ Case Size

Cap.(μF) \ W.V.	10(1A)	16(1C)	25(1E)	35(1V)	50(1H)	63(1J)	100(2A)
0.47					B		
1.0					B		
2.2					B		
3.3					B		E
4.7			B	B	C		F
10		B	C	C	D	E	F
22		C	D	D	E	F	G
33			D	E	F	G	
47		D	E	F	G		
100	E	F	F	G			
220	F	G		G			
330	G		G				

■ Standard Products

W.V. (V)	Cap. (±20%) (μF)	Case size Dia. (mm)	Length (mm)	Size Code	Specification Ripple Current (120Hz) (+105°C) (mA)	Impedance (100kHz) (+20°C) (Ω)	tan δ (120Hz) (+20°C)	Part No. (RoHS: not compliant)	Reflow	Min. Packaging Q'ty Taping (pcs)
10	100	8	6.2	E	62	2.0	0.30	EEVHD1A101P	(2)	1000
	220	8	10.2	F	93	1.5	0.30	EEVHD1A221P	(2)	500
	330	10	10.2	G	118	0.8	0.30	EEVHD1A331P	(2)	500
16	10	4	5.8	B	20	12.0	0.20	EEVHD1C100R	(1)	2000
	22	5	5.8	C	33	7.2	0.20	EEVHD1C220R	(1)	1000
	47	6.3	5.8	D	55	4.0	0.20	EEVHD1C470P	(1)	1000
	100	8	10.2	F	89	1.5	0.23	EEVHD1C101P	(2)	500
	220	10	10.2	G	113	0.8	0.23	EEVHD1C221P	(2)	500
25	4.7	4	5.8	B	15	12.0	0.16	EEVHD1E4R7R	(1)	2000
	10	5	5.8	C	26	7.2	0.16	EEVHD1E100R	(1)	1000
	22	6.3	5.8	D	42	4.0	0.16	EEVHD1E220P	(1)	1000
	33	6.3	5.8	D	52	4.0	0.16	EEVHD1E330P	(1)	1000
	47	8	6.2	E	56	2.0	0.18	EEVHD1E470P	(2)	1000
	100	8	10.2	F	84	1.5	0.18	EEVHD1E101P	(2)	500
	330	10	10.2	G	112	0.8	0.18	EEVHD1E331P	(2)	500
35	4.7	4	5.8	B	17	12.0	0.13	EEVHD1V4R7R	(1)	2000
	10	5	5.8	C	28	7.2	0.13	EEVHD1V100R	(1)	1000
	22	6.3	5.8	D	47	4.0	0.13	EEVHD1V220P	(1)	1000
	33	8	6.2	E	53	2.0	0.16	EEVHD1V330P	(2)	1000
	47	8	10.2	F	79	1.5	0.16	EEVHD1V470P	(2)	500
	100	10	10.2	G	101	0.8	0.16	EEVHD1V101P	(2)	500
	220	10	10.2	G	106	0.8	0.16	EEVHD1V221P	(2)	500
50	0.47	4	5.8	B	5	12.0	0.12	EEVHD1HR47R	(1)	2000
	1.0	4	5.8	B	7	12.0	0.12	EEVHD1H1R0R	(1)	2000
	2.2	4	5.8	B	12	12.0	0.12	EEVHD1H2R2R	(1)	2000
	3.3	4	5.8	B	16	12.0	0.12	EEVHD1H3R3R	(1)	2000
	4.7	5	5.8	C	21	7.2	0.12	EEVHD1H4R7R	(1)	1000
	10	6.3	5.8	D	33	4.0	0.12	EEVHD1H100P	(1)	1000
	22	8	6.2	E	50	2.0	0.14	EEVHD1H220P	(2)	1000
	33	8	10.2	F	74	1.5	0.14	EEVHD1H330P	(2)	500
	47	10	10.2	G	94	0.8	0.14	EEVHD1H470P	(2)	500
63	10	8	6.2	E	45	2.0	0.18	EEVHD1J100P	(2)	1000
	22	8	10.2	F	65	1.5	0.18	EEVHD1J220P	(2)	500
	33	10	10.2	G	80	0.8	0.18	EEVHD1J330P	(2)	500
100	3.3	8	6.2	E	30	2.0	0.18	EEVHD2A3R3P	(2)	1000
	4.7	8	10.2	F	50	1.5	0.18	EEVHD2A4R7P	(2)	500
	10	8	10.2	F	55	1.5	0.18	EEVHD2A100P	(2)	500
	22	10	10.2	G	70	0.8	0.18	EEVHD2A220P	(2)	500

An explanation of the taping dimensions can be found on page 84.
Reflow profiles can be found on page 86.
Endurance: 105°C 5000h

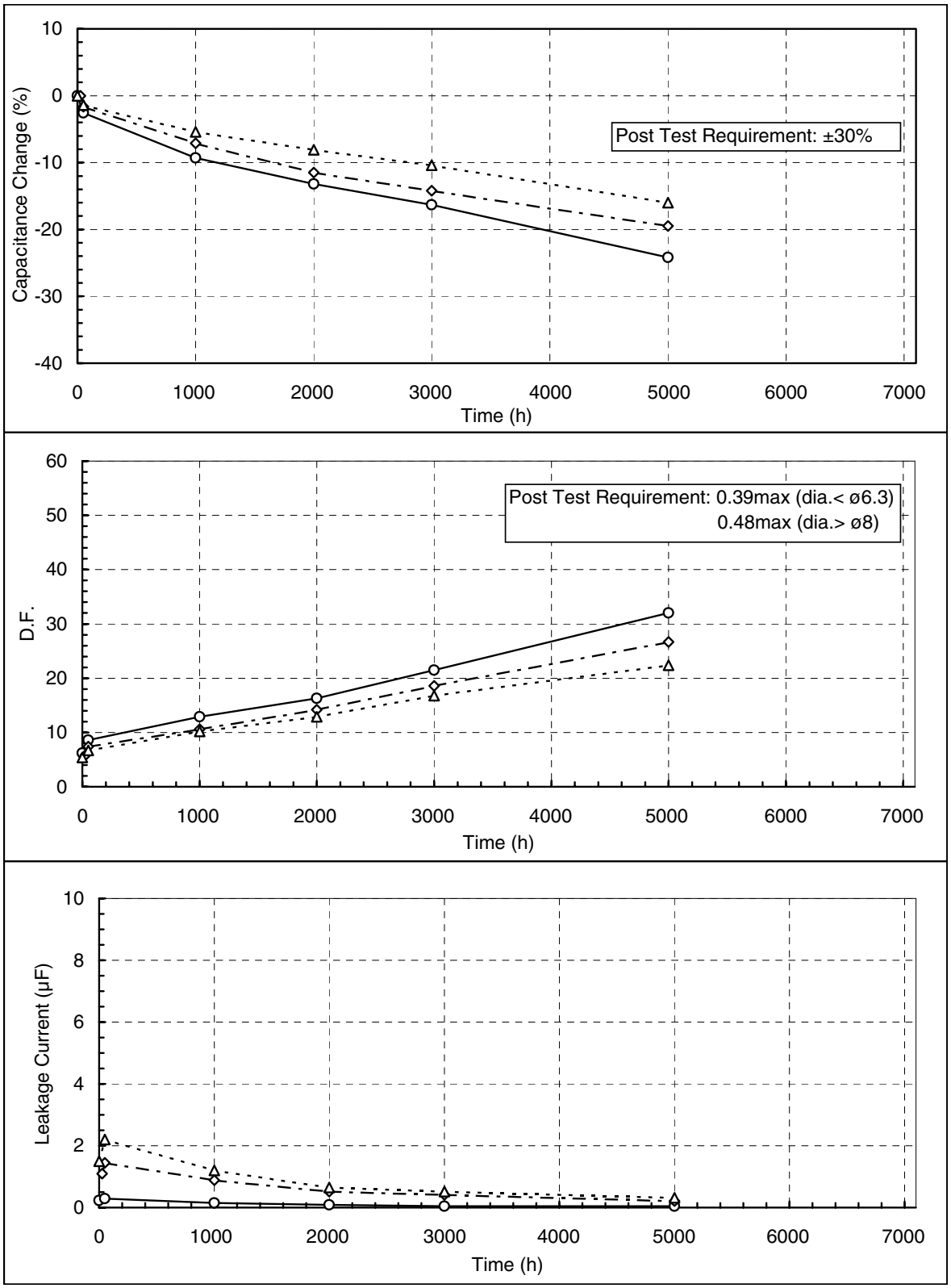
■ Frequency Correction Factor of Rated Ripple Current

	Frequency (Hz)			
	50 ≤ f <100	100 ≤ f <1k	1k ≤ f <10k	10k ≤ f
coefficient	0.70	1.0	1.3	1.7

■ Endurance

EEVHD1V4R7R (35V4.7µF, ø4x5.8)
EEVHD1V220P (35V22µF, ø6.3x5.8)
EEVHD1V101P (35V100µF, ø10x10.2)

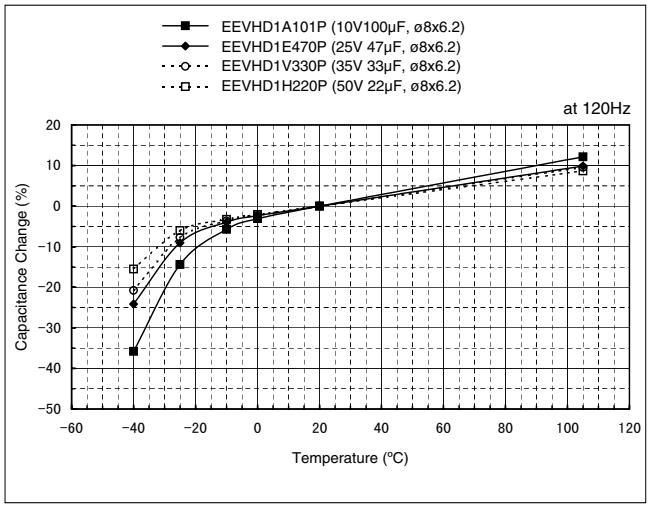
at 105ºC



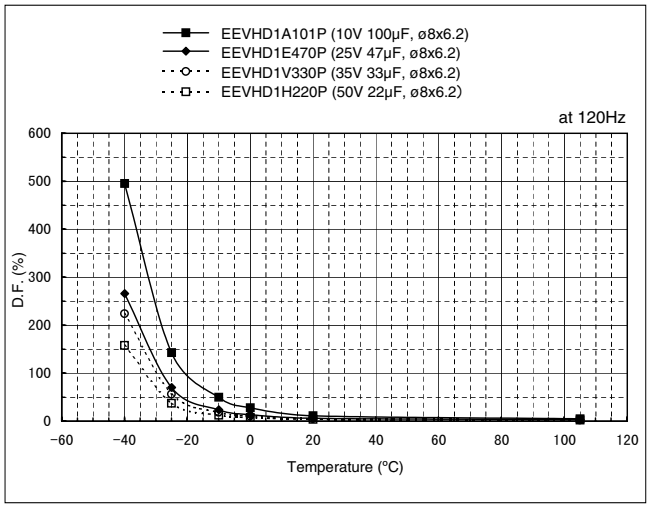
■ Temperature Characteristics

● Diameter ø8x6.2

❍ Capacitance

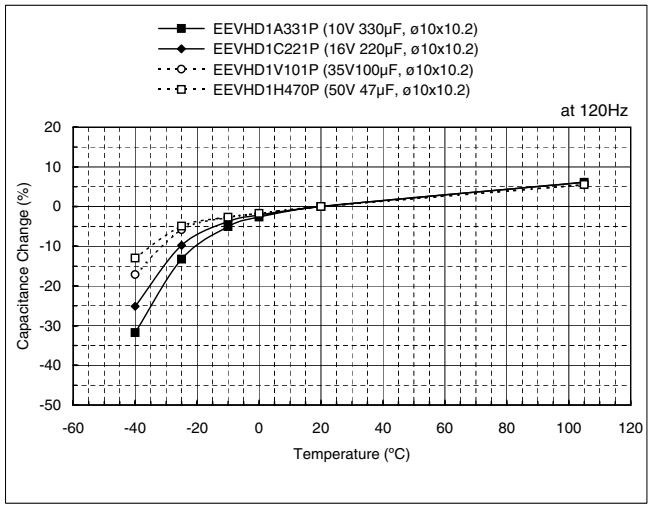


❍ D.F.

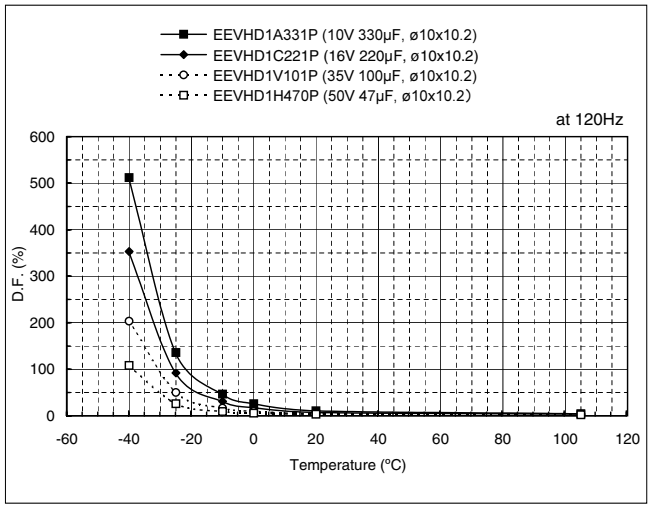


● Diameter ø10x10.2

❍ Capacitance

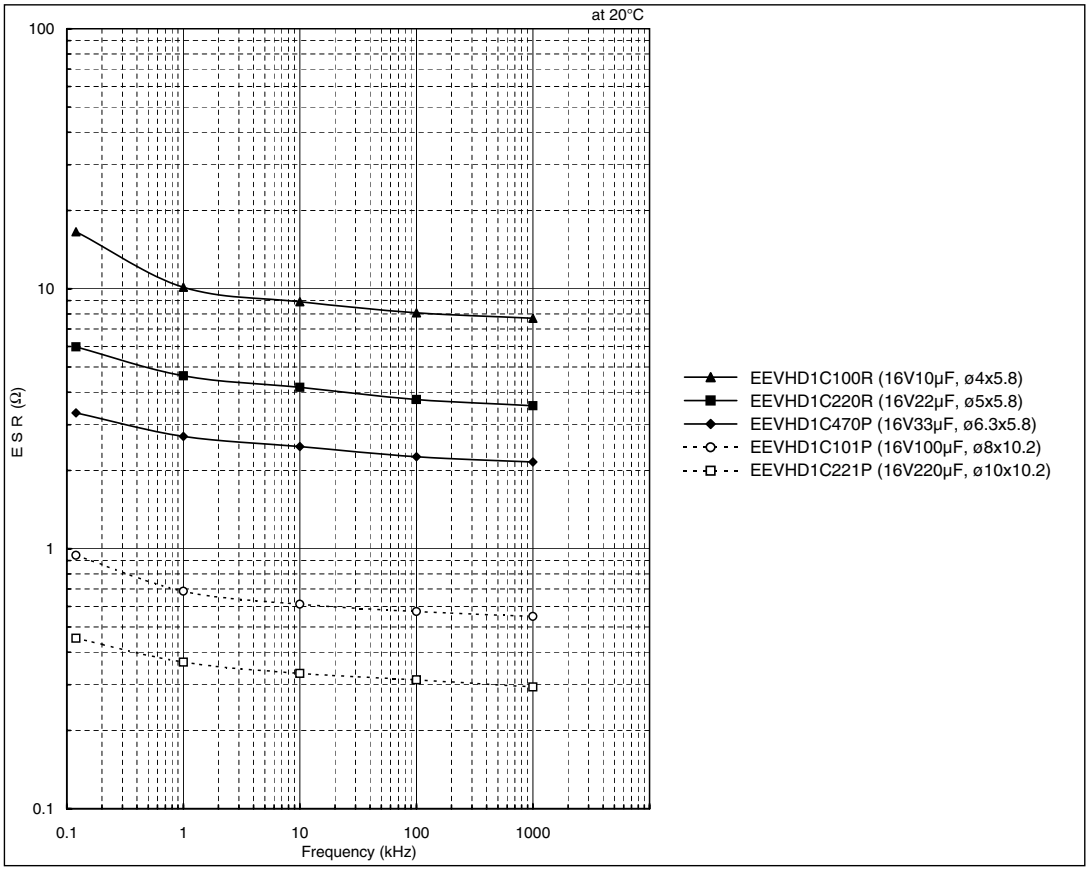


❍ D.F.

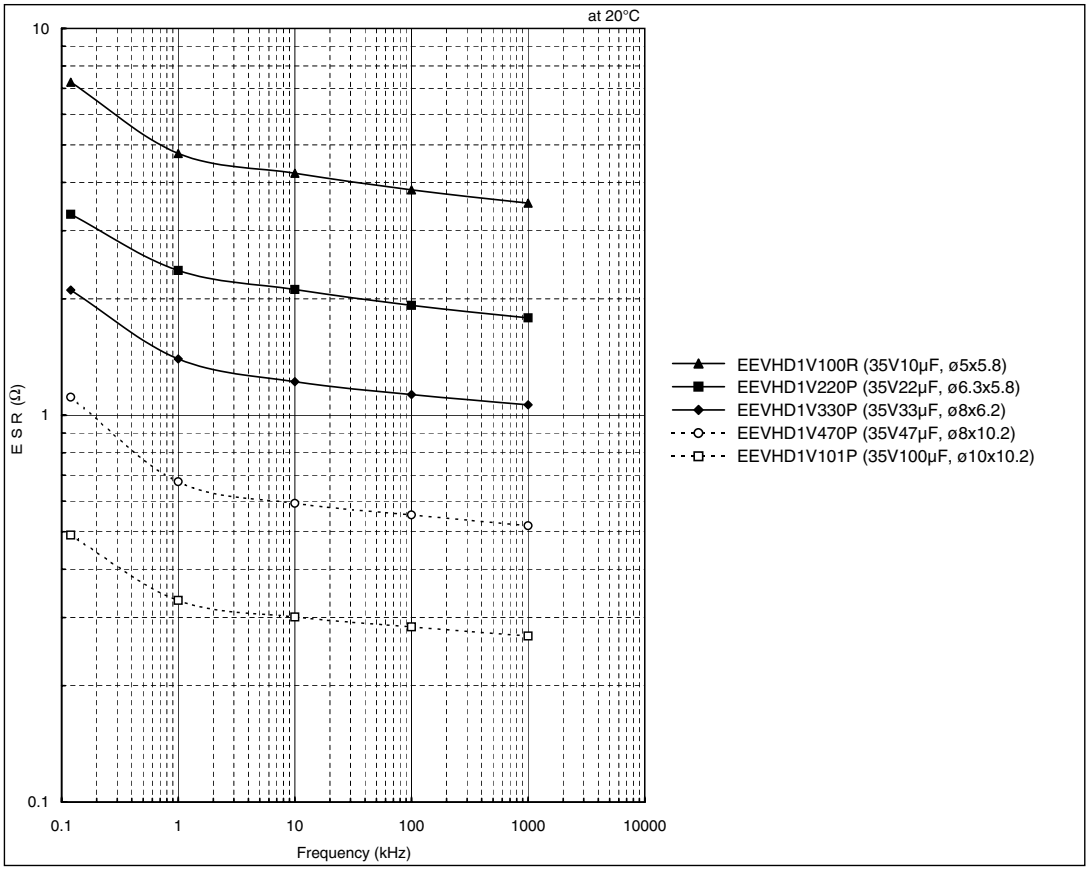


■ Temperature Characteristics – ESR

● 16V



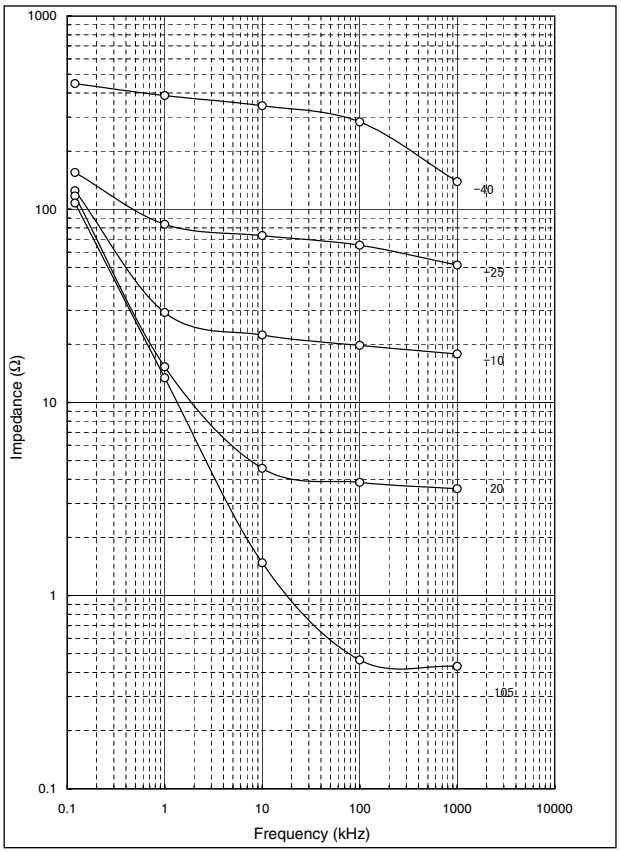
● 35V



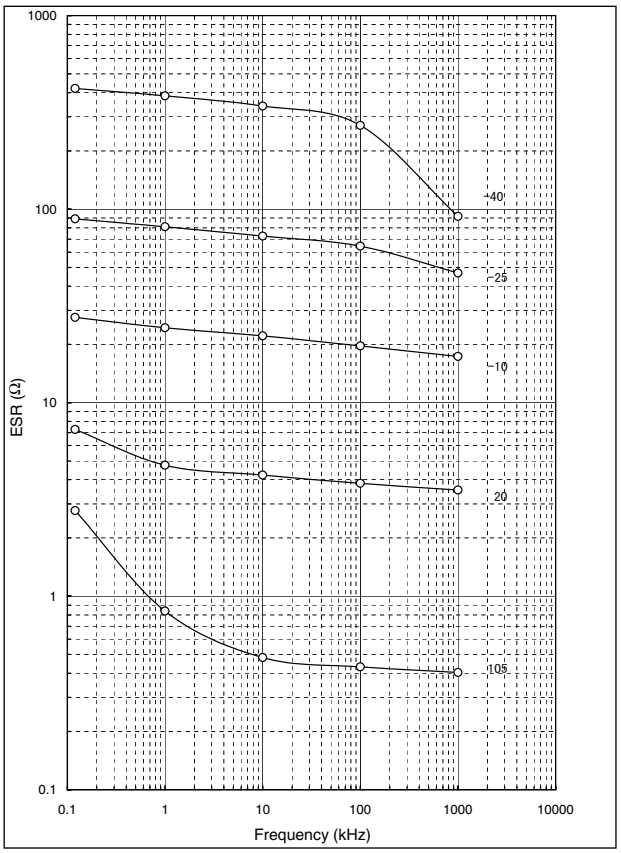
■ Temperature Characteristics

● EEVHD1V100R (35V 10μF, ø5x5.8)

❍ Impedance

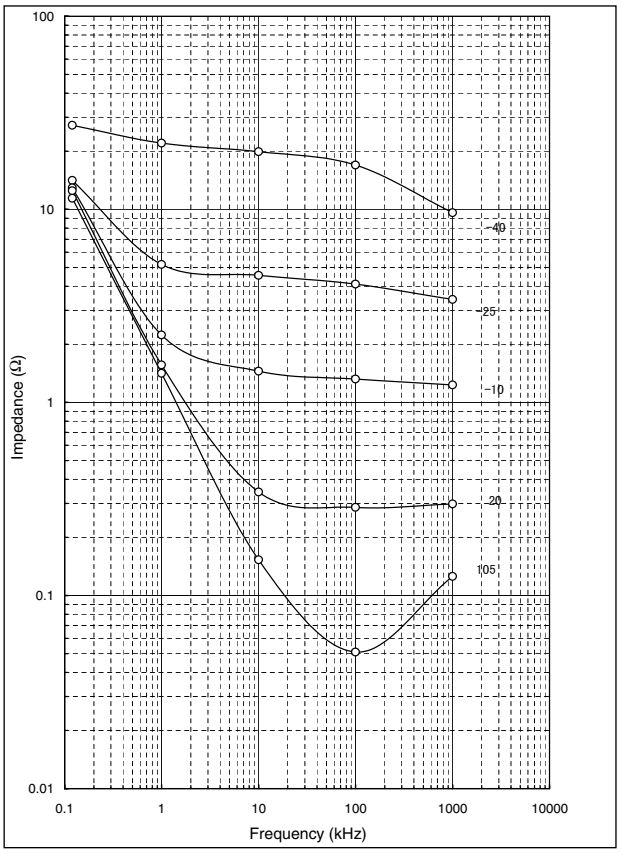


❍ ESR

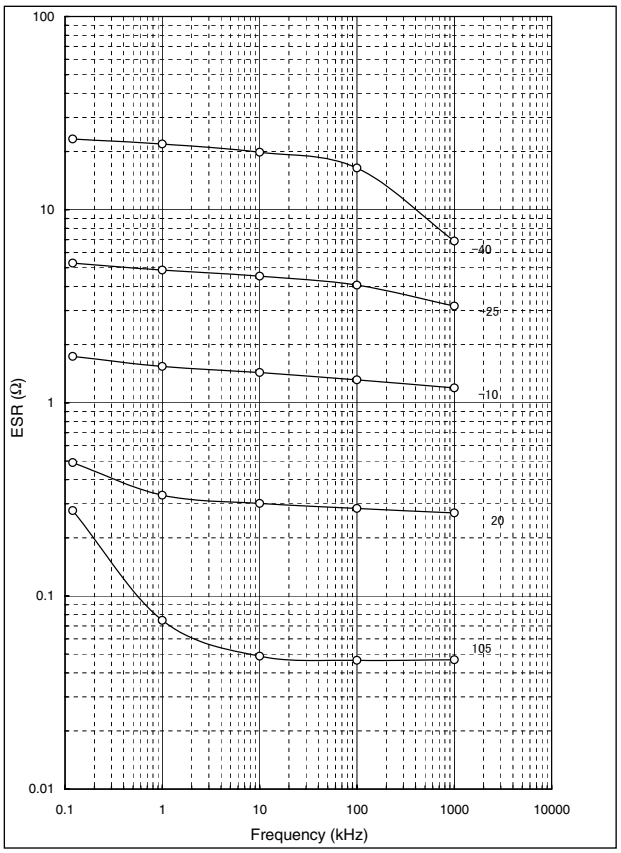


● EEVHD1V101P (35V 100μF, ø10x10.2)

❍ Impedance



❍ ESR



Pre-fix	Suffix	Case Diameter	RoHS Compliant	Terminal Finish	Reflow Condition		Reflow Chart
					Peak Temperature	Time above 200	
ECE-V	R	3mm to 5mm	No	Sn-Pb	240 for 5 seconds	20 seconds	(1) Fig.1
	P	6mm	No	Sn-Pb	240 for 5 seconds	20 seconds	(1) Fig.1
	P	8mm to 10mm	No	Sn-Pb	230 for 5 seconds	20 seconds	(2) Fig.2
EEV-	R	4mm to 5mm	No	Sn-Pb	240 for 5 seconds	20 seconds	(1) Fig.1
	P	6mm	No	Sn-Pb	240 for 5 seconds	20 seconds	(1) Fig.1
	P	8mm to 10mm	No	Sn-Pb	230 for 5 seconds	20 seconds	(2) Fig.2
	Q	12.5mm	Yes	Sn	230 for 5 seconds	20 seconds	(2) Fig.2 (Except for EB series)
							(3) Fig.3 (EB series only)
	M	16mm to 18mm	Yes	Sn	230 for 5 seconds	20 seconds	(2) Fig.2 (Except for EB series)
							(3) Fig.3 (EB series only)
EEE-	R	3mm to 5mm	Yes	Sn-Bi	250 for 5 seconds	60 seconds	(4) Fig.4
	P	6mm	Yes	Sn-Bi	250 for 5 seconds	60 seconds	(4) Fig.4
	P	8mm to 10mm	Yes	Sn-Bi	235 for 5 seconds	60 seconds	(5) Fig.5