

Surface Mount Type

Series: HD Type : V

- Features Endurance: 5000h at 105°C
Vibration-proof product is available upon request.($\phi 8 \leq$)
RoHS directive not compliant



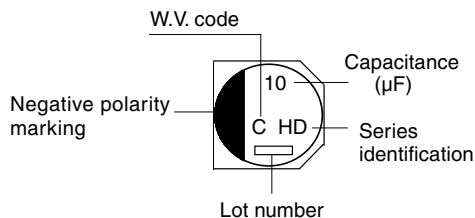
■ Specifications

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 ≤0.01 CV 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	(Impedance ratio at 120 Hz)
	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	
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. 16V10 μ F

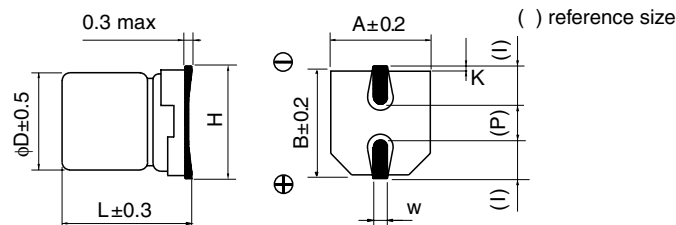
Marking color : BLACK



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 $\pm$ 0.1	1.0	0.35 -0.20 to +0.15
C	5.0	5.8	5.3	6.5	2.2	0.65 $\pm$ 0.1	1.5	0.35 -0.20 to +0.15
D	6.3	5.8	6.6	7.8	2.6	0.65 $\pm$ 0.1	1.8	0.35 -0.20 to +0.15
E	8.0	6.2	8.3	9.5	3.4	0.65 $\pm$ 0.1	2.2	0.35 -0.20 to +0.15
F	8.0	10.2	8.3	10.0	3.4	0.90 $\pm$ 0.2	3.1	0.70 $\pm$ 0.20
G	10.0	10.2	10.3	12.0	3.5	0.90 $\pm$ 0.2	4.6	0.70 $\pm$ 0.20

■ Case Size

Cap.(μ F) \ 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.	Cap. (±20%)	Case size			Specification			Part No. (RoHS: not compliant)	Min. Packaging Q'ty	
		Dia.	Length	Size Code	Ripple Current (120Hz) (+105°C) (mA)	Impe- dance (100kHz) (+20°C) (Ω)	tan δ (120Hz) (+20°C)			
(V)	(μF)	(mm)	(mm)							
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
63	47	10	10.2	G	94	0.8	0.14	EEVHD1H470P	(2)	500
	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
100	33	10	10.2	G	80	0.8	0.18	EEVHD1J330P	(2)	500
	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.

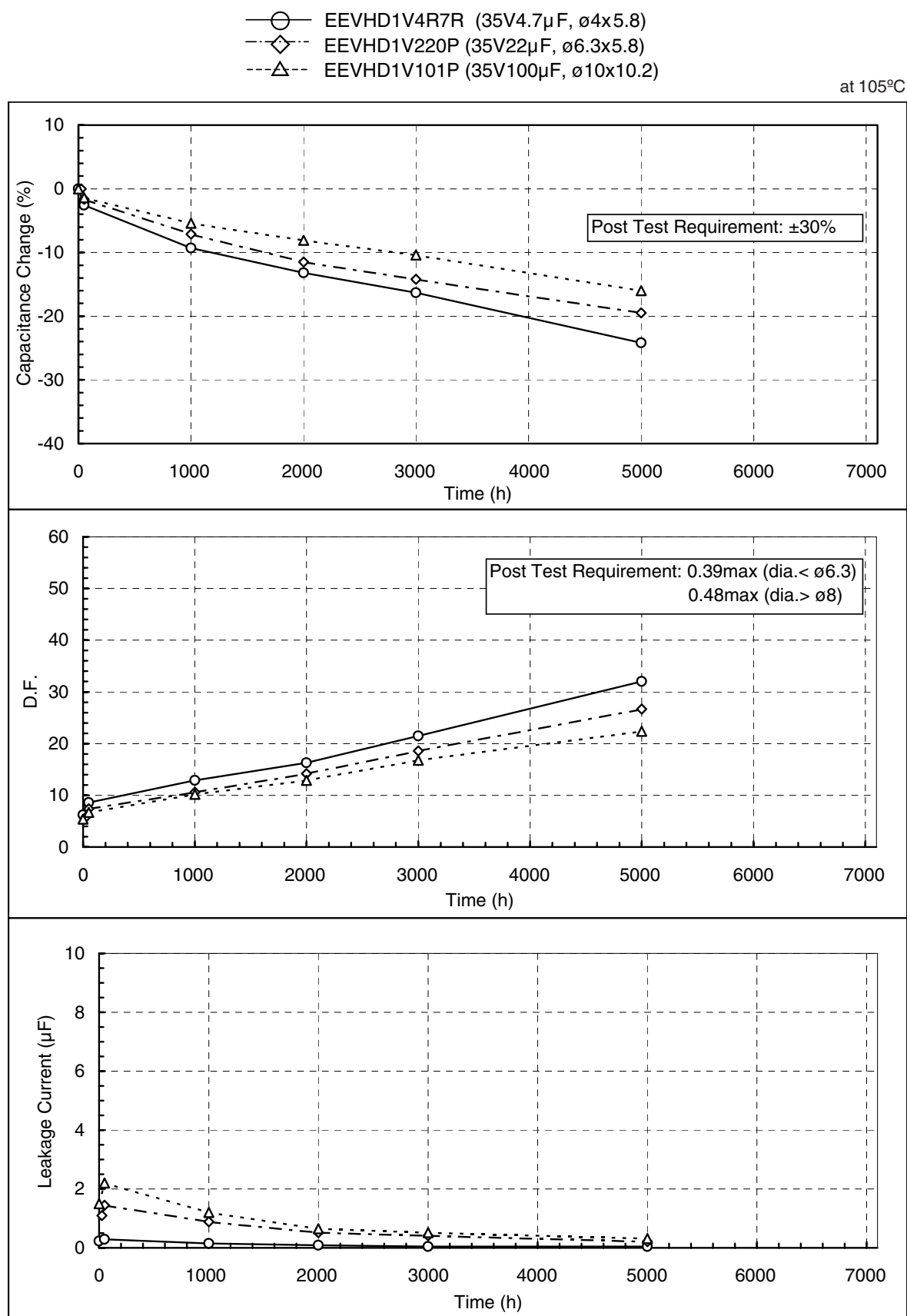
Reflow profiles can be found on page 86.

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

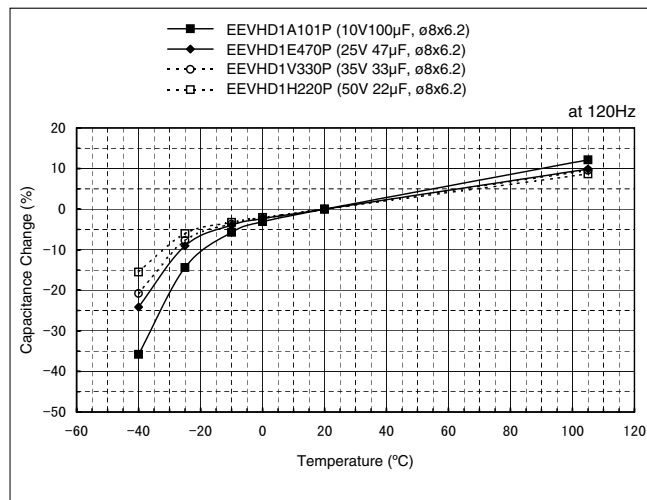
■ Endurance



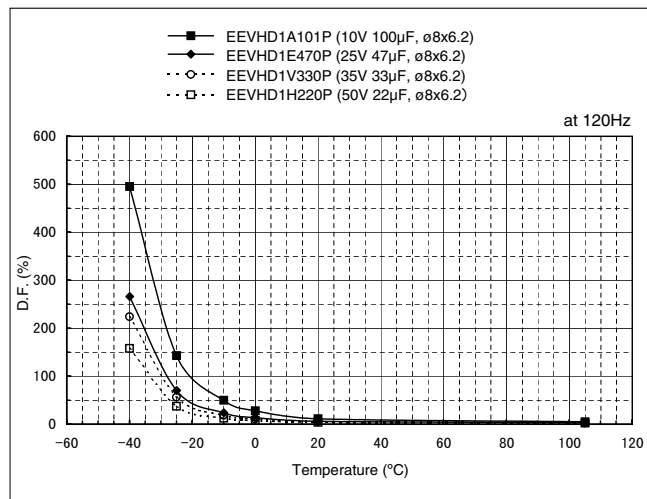
■ Temperature Characteristics

● Diameter $\phi 8 \times 6.2$

○ Capacitance

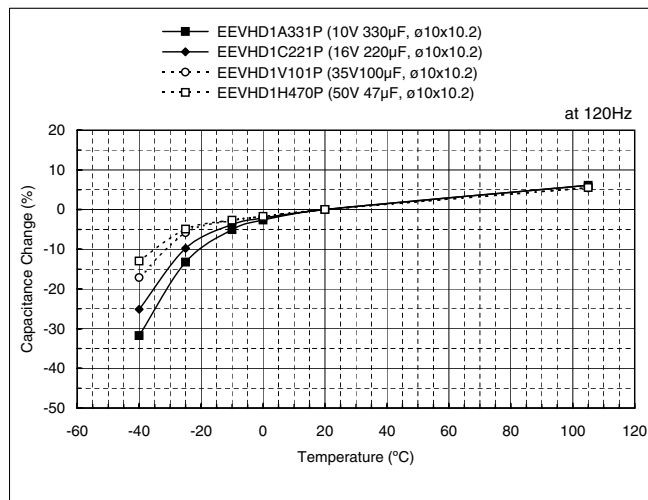


○ D.F.

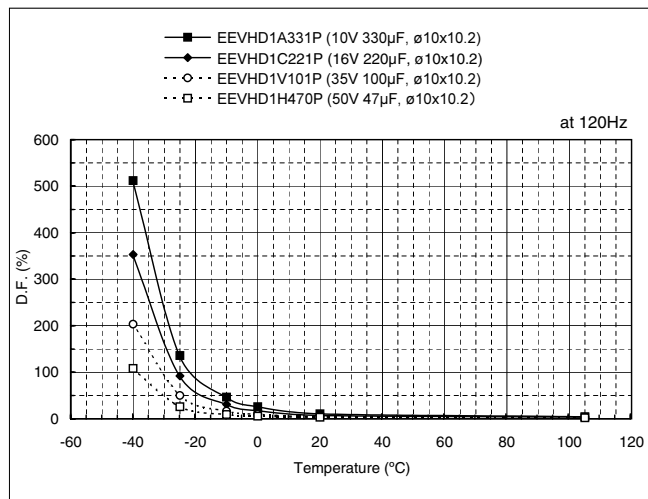


● Diameter $\phi 10 \times 10.2$

○ Capacitance

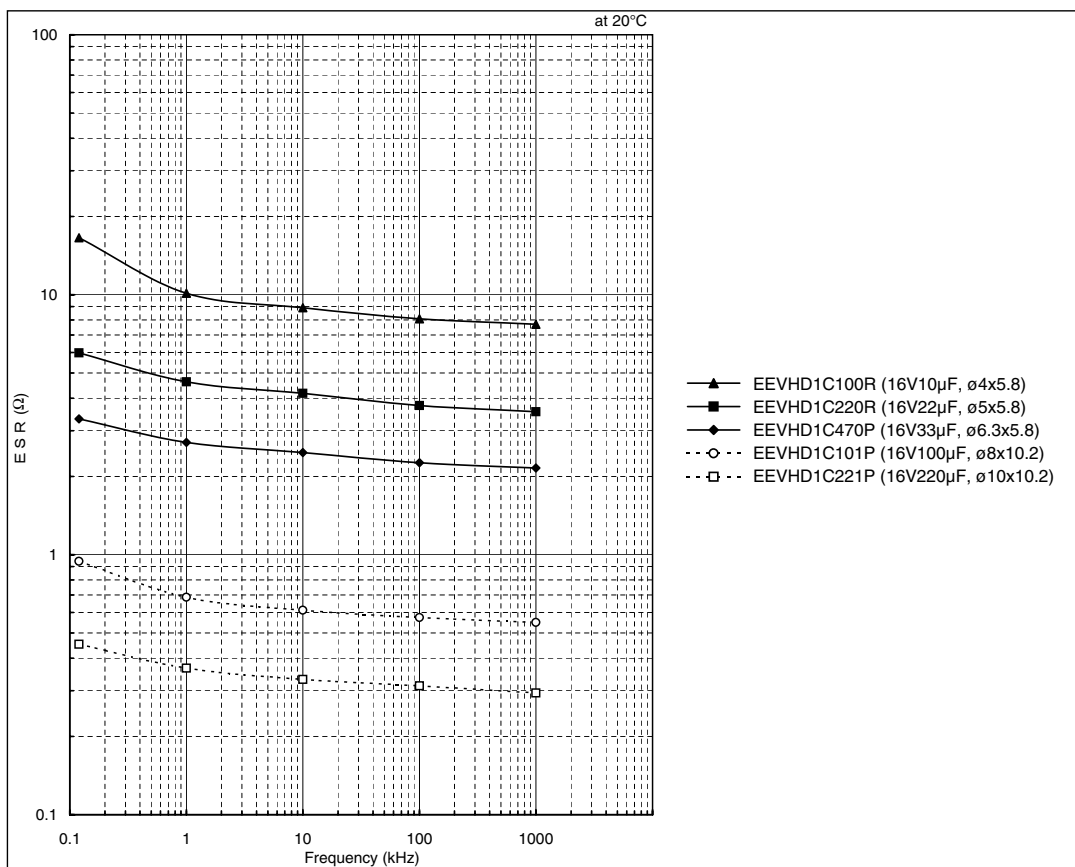


○ D.F.

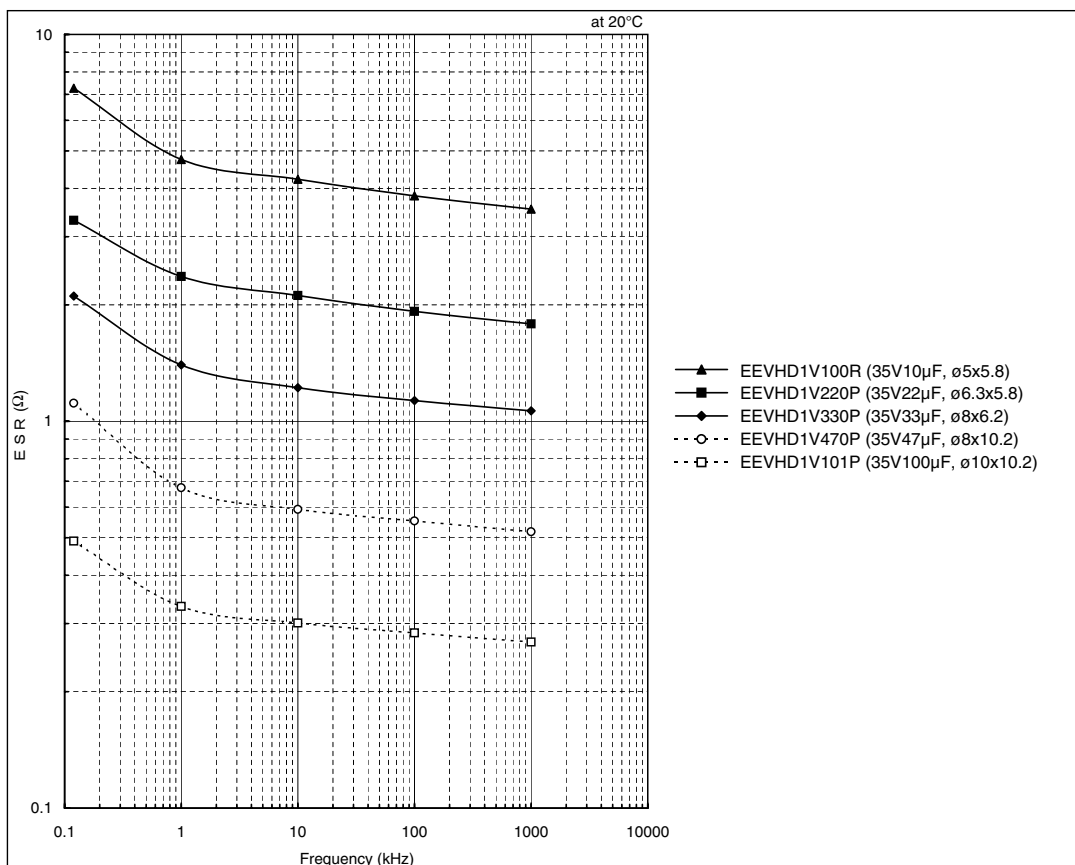


■ Temperature Characteristics – ESR

● 16V



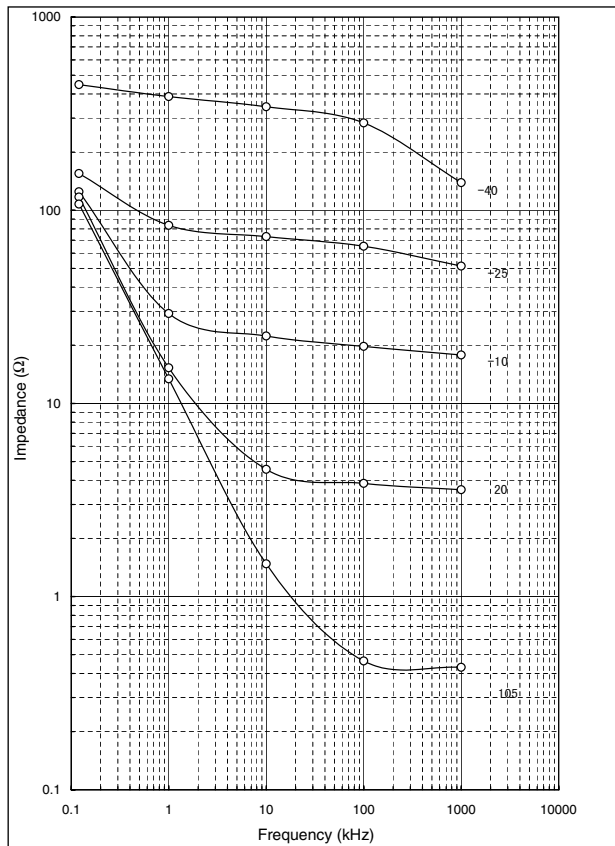
● 35V



■ Temperature Characteristics

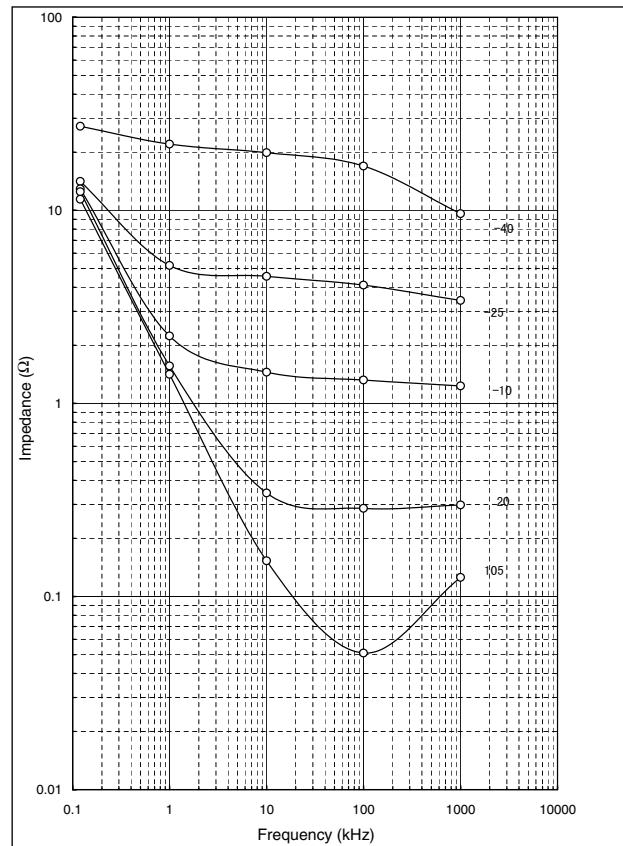
● EEVHD1V100R (35V 10 μ F, ϕ 5x5.8)

○ Impedance

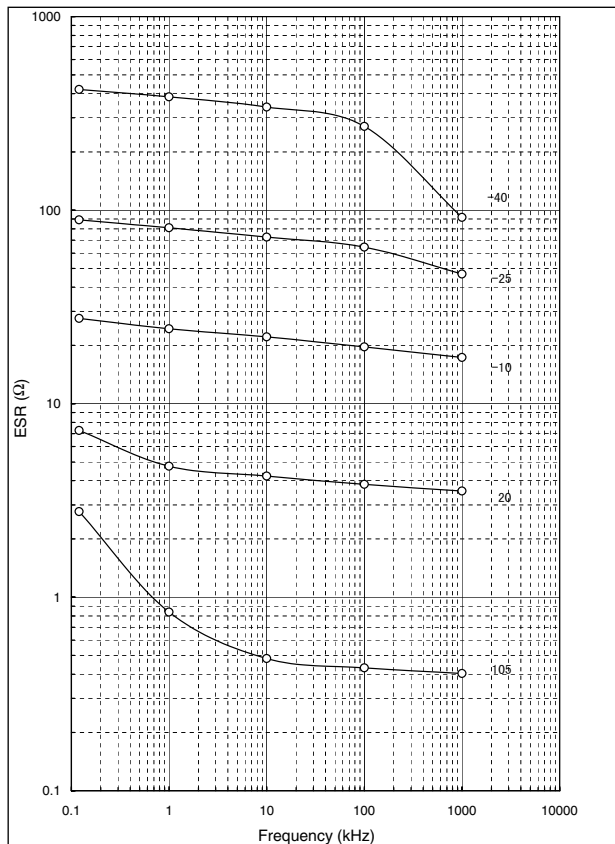


● EEVHD1V101P (35V 100 μ F, ϕ 10x10.2)

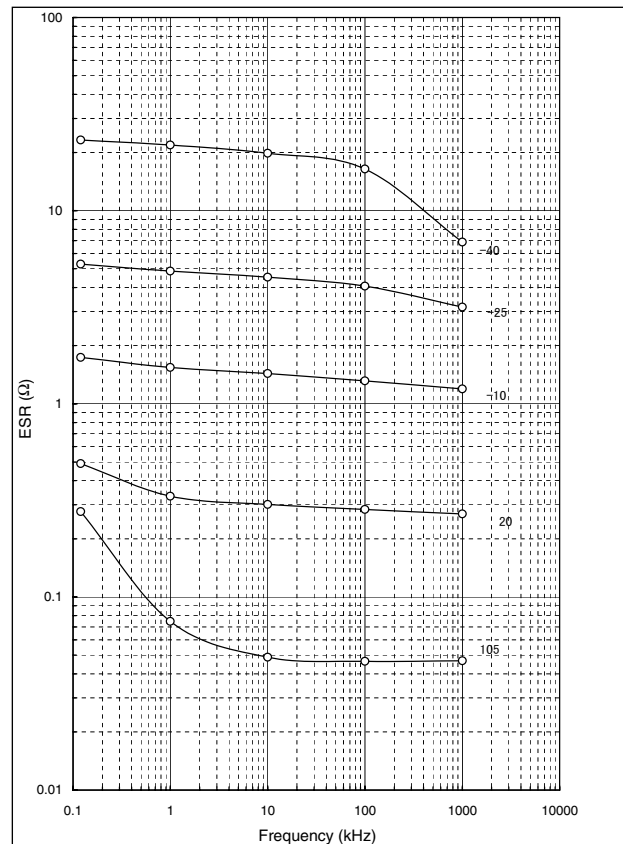
○ Impedance



○ ESR



○ 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

