

Surface Mount Type

Series: FC Type : V

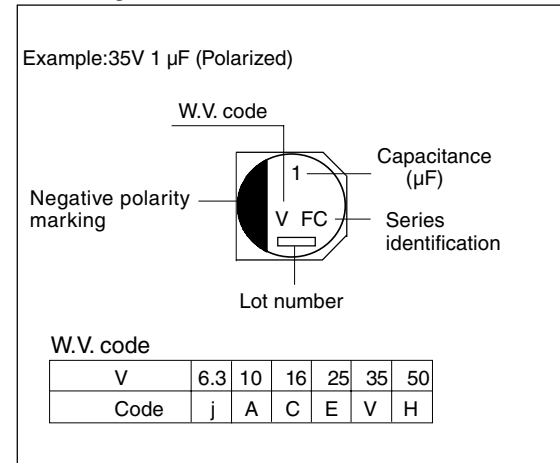
- Features
 - Endurance : 105°C 1000 h
 - Low impedance (1/2 for HA series)
 - 5.4 mm height ($\leq \phi 6.3$)
 - Vibration-proof product is available upon request. ($\phi 8 \leq$)
 - RoHS directive compliant(Parts No:EEE*)



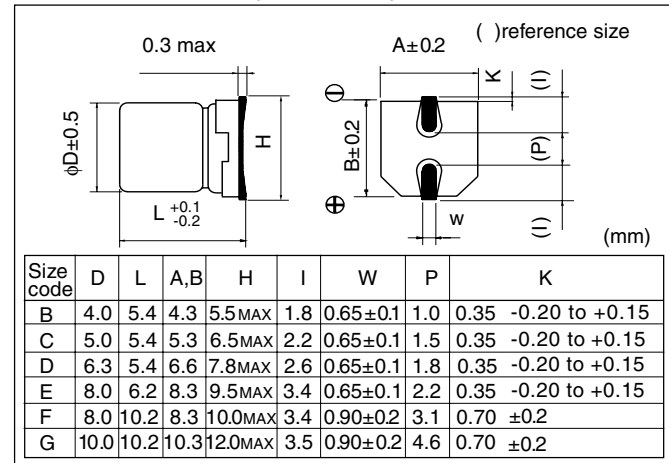
■ Specifications

Category temp. range								-40 to +105°C
Rated W.V. Range								6.3 to 50 V .DC
Nominal Cap. Range								1 to 1500 μ F
Capacitance Tolerance								$\pm 20\%$ (120Hz/+20°C)
DC Leakage Current	I \leq 0.01 CV or 3(μ A) after 2 minutes							(Whichever is greater)
tan δ	W.V. (V)	6.3	10	16	25	35	50	(120Hz/+20°C) (max.)
	tan δ	0.26	0.19	0.16	0.14	0.12	0.12	
Characteristics at Low Temperature	W.V. (V)	6.3	10	16	25	35	50	(Impedance ratio at 120 Hz)
	-25 / +20 °C	2	2	2	2	2	2	
	-40 / +20 °C	3	3	3	3	3	3	
Endurance	After applying rated working voltage for 1000 hours at +105 \pm 2°C and then being stabilized at +20°C, capacitors shall meet the following limits.							
	Capacitance change	$\pm 20\%$ of initial measured value						
	tan δ	$\leq 200\%$ of initial specified value						
	DC leakage current	\leq initial specified value						
Shelf Life	After storage for 1000 hours at +105 \pm 2°C with no voltage applied and then being stabilized at +20°C, capacitors shall meet the limits specified in Endurance.(With voltage treatment)							
	After reflow soldering (Refer to page 86 for recommended temperature profile), and then being stabilized at +20°C, capacitor shall meet the following limits.							
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	$\pm 10\%$ of initial measured value						
	tan δ	\leq initial specified value						
	DC leakage current	\leq initial specified value						

■ Marking



■ Dimensions in mm (not to scale)



■ Case size

Cap. (μ F)	W.V.(V)	6.3 (0J)	10 (1A)	16 (1C)	25 (1E)	35 (1V)	50(1H)
1 to 3.3						B	B
4.7						B	C
6.8					B	C	
10				B		C	D
22	B		C		D	D	E
33		C			D	E	F
47	C		D		E	E	G
68	D		E		F		
100	D		E		F	G	G
150			E				
220	E	F		G	G	G	G
330	F		G	G	G	G	
470		G	G	G			
680			G				
1000	G	G					
1500	G						

■ Impedance (Ω) (100kHz/+20°C)

(6.3 to 35W.V)

Size Code	B	C	D	E	F	G
Impedance	3.0	1.8	1.0	0.4	0.3	0.15

(50W.V)

Size Code	B	C	D	E	F	G
Impedance	5.0	3.0	2.0	0.7	0.6	0.3

■ Standard Products

W.V. (V)	Cap. (±20%) (μF)	Case size			Specification		Part No. (RoHS: not compliant)	Reflow	Part No. (RoHS: compliant)	Reflow	Min. Packaging Q'ty Taping (pcs)
		Dia. (mm)	Length (mm)	Size Code	Ripple current (100kHz) (+105°C) (mA)	Impe- dance (100kHz) (+20°C) (Ω)					
6.3	22	4	5.4	B	60	3.00	EEVFC0J220R	(1)	EEEF0J220R	(4)	2000
	47	5	5.4	C	95	1.80	EEVFC0J470R	(1)	EEEF0J470R	(4)	1000
	68	6.3	5.4	D	140	1.00	EEVFC0J680P	(1)	EEEF0J680P	(4)	1000
	100	6.3	5.4	D	140	1.00	EEVFC0J101P	(1)	EEEF0J101P	(4)	1000
	220	8	6.2	E	230	0.40	EEVFC0J221P	(2)	EEEF0J221P	(5)	1000
	330	8	10.2	F	450	0.30	EEVFC0J331P	(2)	EEEF0J331P	(5)	500
	1000	10	10.2	G	670	0.15	EEVFC0J102P	(2)	EEEF0J102P	(5)	500
	1500	10	10.2	G	670	0.15	EEVFC0J152P	(2)	EEEF0J152P	(5)	500
10	33	5	5.4	C	95	1.80	EEVFC1A330R	(1)	EEEF1A330R	(4)	1000
	100	8	6.2	E	230	0.40	EEVFC1A101P	(2)	EEEF1A101P	(5)	1000
	150	8	6.2	E	230	0.40	EEVFC1A151P	(2)	EEEF1A151P	(5)	1000
	220	8	10.2	F	450	0.30	EEVFC1A221P	(2)	EEEF1A221P	(5)	500
	470	10	10.2	G	670	0.15	EEVFC1A471P	(2)	EEEF1A471P	(5)	500
	1000	10	10.2	G	670	0.15	EEVFC1A102P	(2)	EEEF1A102P	(5)	500
16	10	4	5.4	B	60	3.00	EEVFC1C100R	(1)	EEEF1C100R	(4)	2000
	22	5	5.4	C	95	1.80	EEVFC1C220R	(1)	EEEF1C220R	(4)	1000
	47	6.3	5.4	D	140	1.00	EEVFC1C470P	(1)	EEEF1C470P	(4)	1000
	68	8	6.2	E	230	0.40	EEVFC1C680P	(2)	EEEF1C680P	(5)	1000
	100	8	6.2	E	230	0.40	EEVFC1C101P	(2)	EEEF1C101P	(5)	1000
	220	10	10.2	G	670	0.15	EEVFC1C221P	(2)	EEEF1C221P	(5)	500
	330	10	10.2	G	670	0.15	EEVFC1C331P	(2)	EEEF1C331P	(5)	500
	470	10	10.2	G	670	0.15	EEVFC1C471P	(2)	EEEF1C471P	(5)	500
	680	10	10.2	G	670	0.15	EEVFC1C681P	(2)	EEEF1C681P	(5)	500
25	6.8	4	5.4	B	60	3.00	EEVFC1E6R8R	(1)	EEEF1E6R8R	(4)	2000
	22	6.3	5.4	D	140	1.00	EEVFC1E220P	(1)	EEEF1E220P	(4)	1000
	33	6.3	5.4	D	140	1.00	EEVFC1E330P	(1)	EEEF1E330P	(4)	1000
	47	8	6.2	E	230	0.40	EEVFC1E470P	(2)	EEEF1E470P	(5)	1000
	68	8	10.2	F	450	0.30	EEVFC1E680P	(2)	EEEF1E680P	(5)	500
	100	8	10.2	F	450	0.30	EEVFC1E101P	(2)	EEEF1E101P	(5)	500
	220	10	10.2	G	670	0.15	EEVFC1E221P	(2)	EEEF1E221P	(5)	500
	330	10	10.2	G	670	0.15	EEVFC1E331P	(2)	EEEF1E331P	(5)	500
	470	10	10.2	G	670	0.15	EEVFC1E471P	(2)	EEEF1E471P	(5)	500
35	1	4	5.4	B	60	3.00	EEVFC1V1R0R	(1)	EEEF1V1R0R	(4)	2000
	2.2	4	5.4	B	60	3.00	EEVFC1V2R2R	(1)	EEEF1V2R2R	(4)	2000
	3.3	4	5.4	B	60	3.00	EEVFC1V3R3R	(1)	EEEF1V3R3R	(4)	2000
	4.7	4	5.4	B	60	3.00	EEVFC1V4R7R	(1)	EEEF1V4R7R	(4)	2000
	6.8	5	5.4	C	95	1.80	EEVFC1V6R8R	(1)	EEEF1V6R8R	(4)	1000
	10	5	5.4	C	95	1.80	EEVFC1V100R	(1)	EEEF1V100R	(4)	1000
	22	6.3	5.4	D	140	1.00	EEVFC1V220P	(1)	EEEF1V220P	(4)	1000
	33	8	6.2	E	230	0.40	EEVFC1V330P	(2)	EEEF1V330P	(5)	1000
	47	8	6.2	E	230	0.40	EEVFC1V470P	(2)	EEEF1V470P	(5)	1000
	100	10	10.2	G	670	0.15	EEVFC1V101P	(2)	EEEF1V101P	(5)	500
	220	10	10.2	G	670	0.15	EEVFC1V221P	(2)	EEEF1V221P	(5)	500

An explanation of the taping dimensions can be found on page 84.

Reflow profiles can be found on page 86.

Endurance: 105°C 1000h

■ Standard Products

W.V. (V)	Cap. (±20%) (μF)	Case size			Specification		Part No. (RoHS: not compliant)	Reflow	Part No. (RoHS: compliant)	Reflow	Min. Packaging Q'ty Taping (pcs)
		Dia. (mm)	Length (mm)	Size Code	Ripple current (100kHz) (+105°C) (mA)	Impe- dance (100kHz) (+20°C) (Ω)					
35	330	10	10.2	G	670	0.15	EEVFC1V331P	(2)	EEEFC1V331P	(5)	500
50	1	4	5.4	B	30	5.00	EEVFC1H1R0R	(1)	EEEFC1H1R0R	(4)	2000
	2.2	4	5.4	B	30	5.00	EEVFC1H2R2R	(1)	EEEFC1H2R2R	(4)	2000
	3.3	4	5.4	B	30	5.00	EEVFC1H3R3R	(1)	EEEFC1H3R3R	(4)	2000
	4.7	5	5.4	C	50	3.00	EEVFC1H4R7R	(1)	EEEFC1H4R7R	(4)	1000
	10	6.3	5.4	D	70	2.00	EEVFC1H100P	(1)	EEEFC1H100P	(4)	1000
	22	8	6.2	E	120	0.70	EEVFC1H220P	(2)	EEEFC1H220P	(5)	1000
	33	8	10.2	F	300	0.60	EEVFC1H330P	(2)	EEEFC1H330P	(5)	500
	47	10	10.2	G	500	0.30	EEVFC1H470P	(2)	EEEFC1H470P	(5)	500
	100	10	10.2	G	500	0.30	EEVFC1H101P	(2)	EEEFC1H101P	(5)	500
	220	10	10.2	G	500	0.30	EEVFC1H221P	(2)	EEEFC1H221P	(5)	500

An explanation of the taping dimensions can be found on page 84.

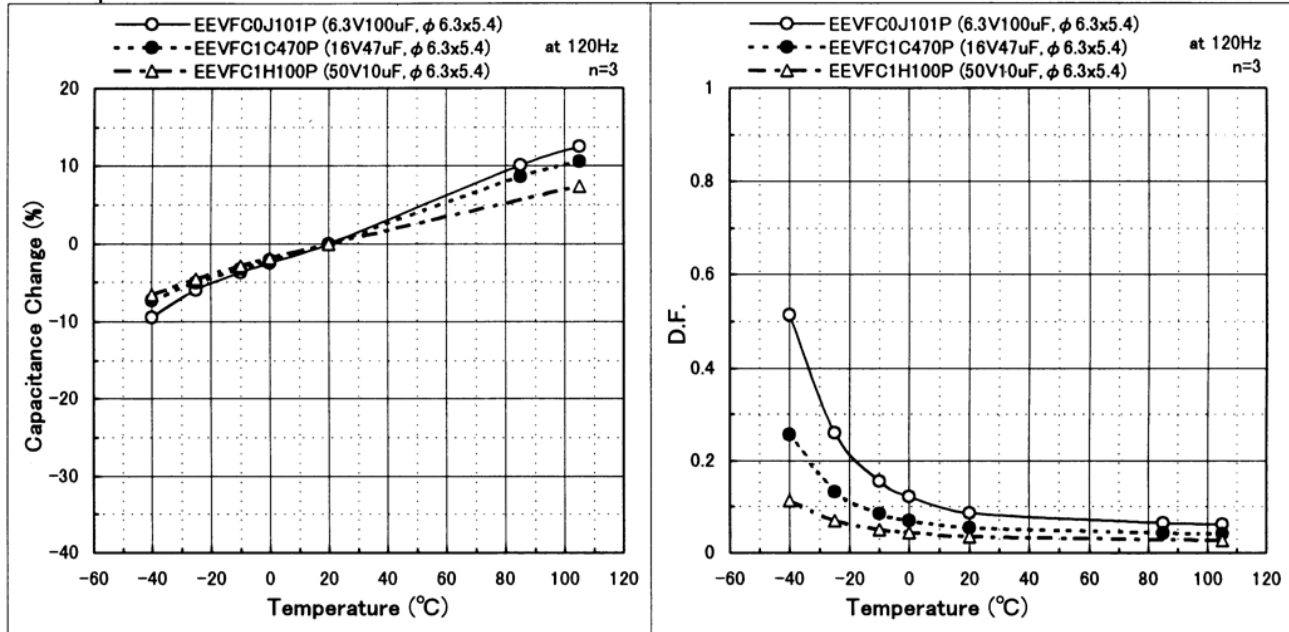
Reflow profiles can be found on page 86.

Endurance: 105°C 1000h

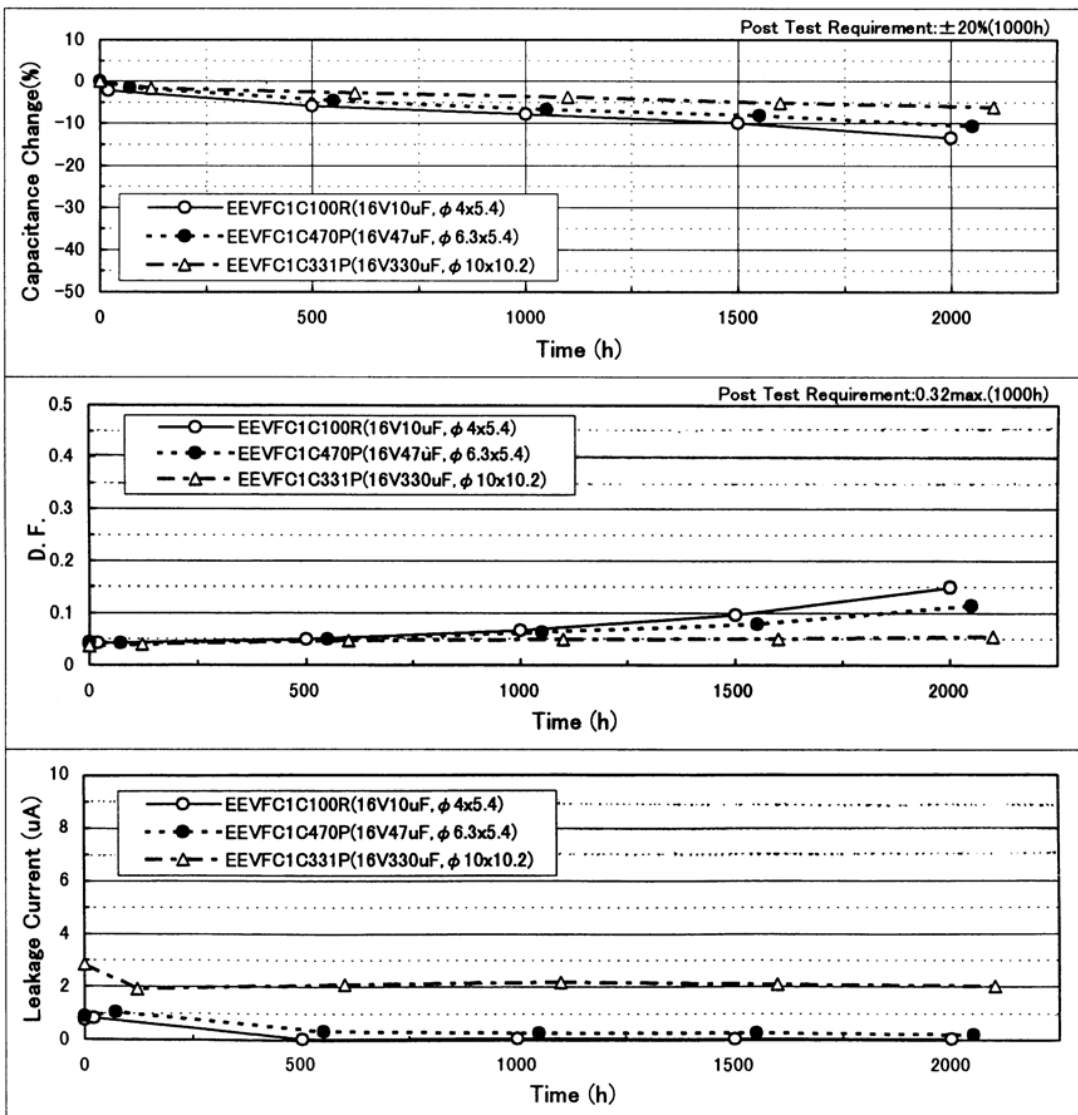
■ Frequency Correction Factor of Rated Ripple Current

	Frequency (Hz)				
	50,60	120	1k	10k	100k~
coefficient	0.70	0.75	0.90	0.95	1.00

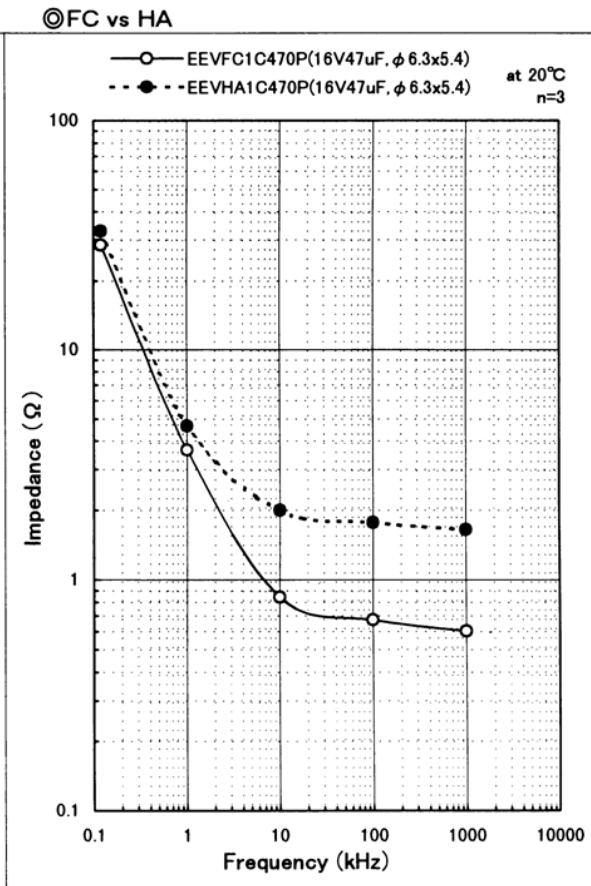
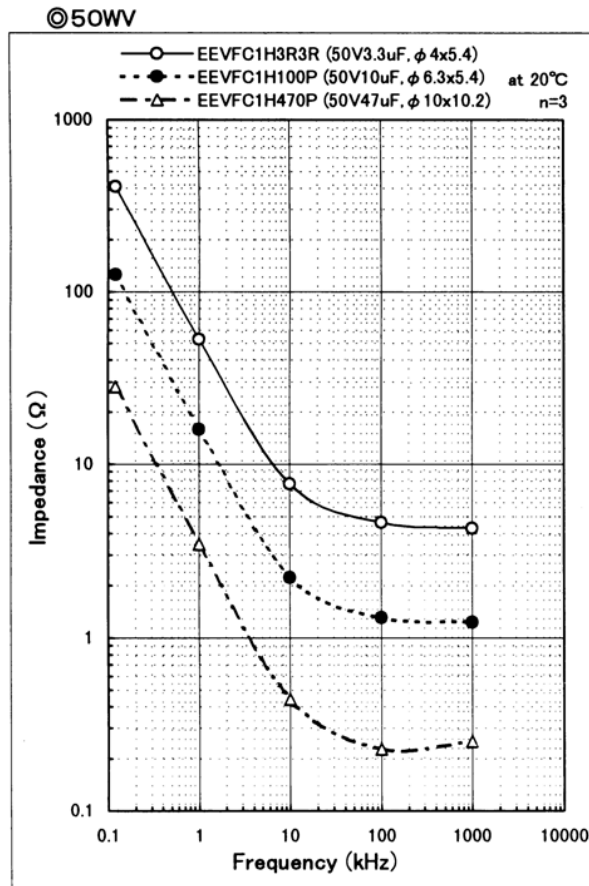
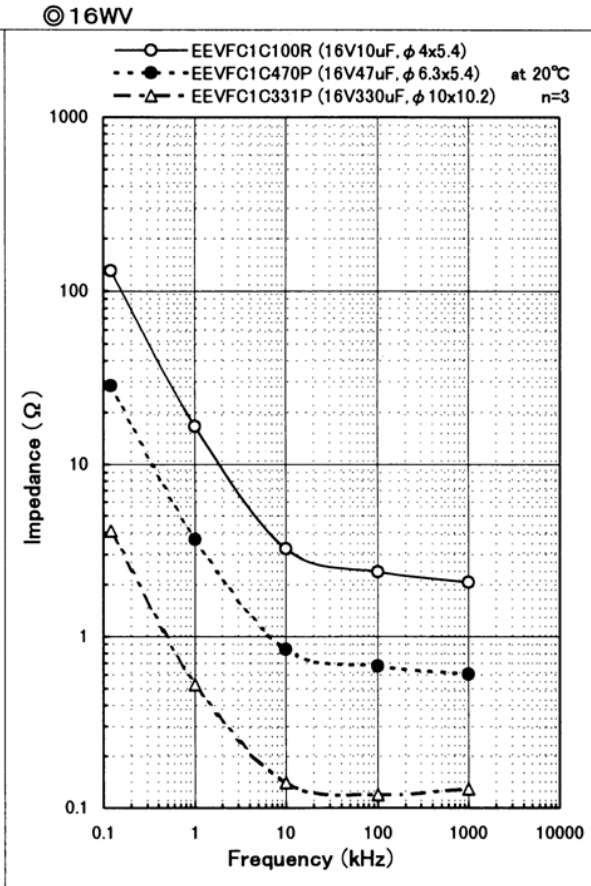
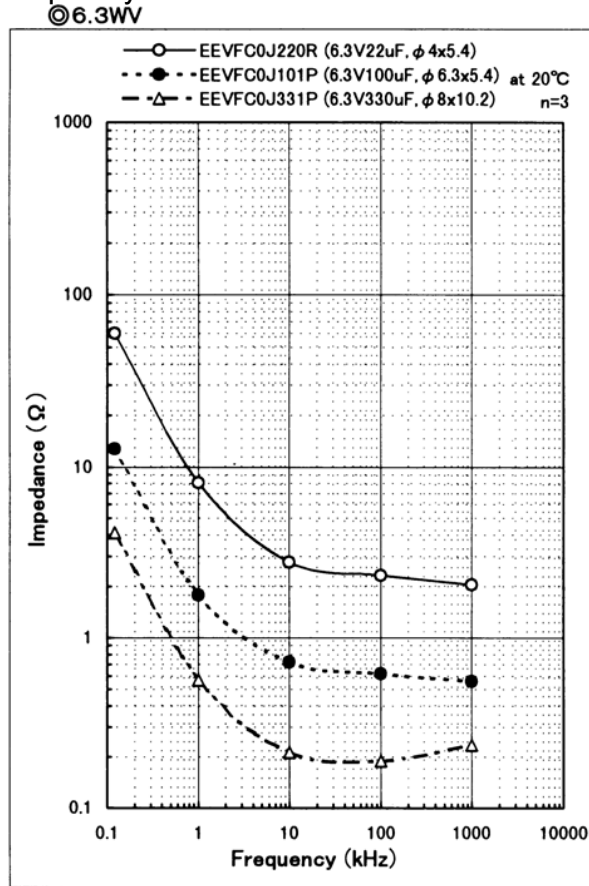
Temperature Characteristics



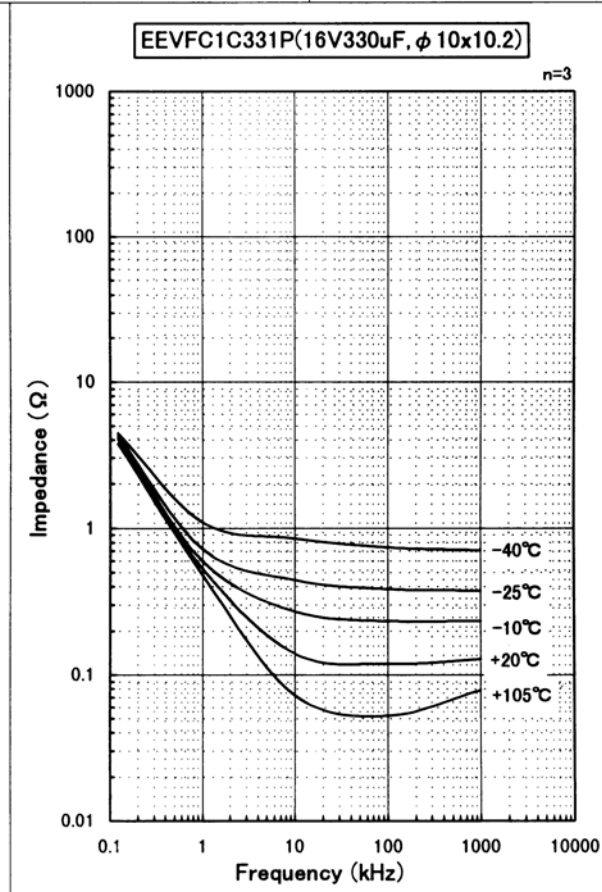
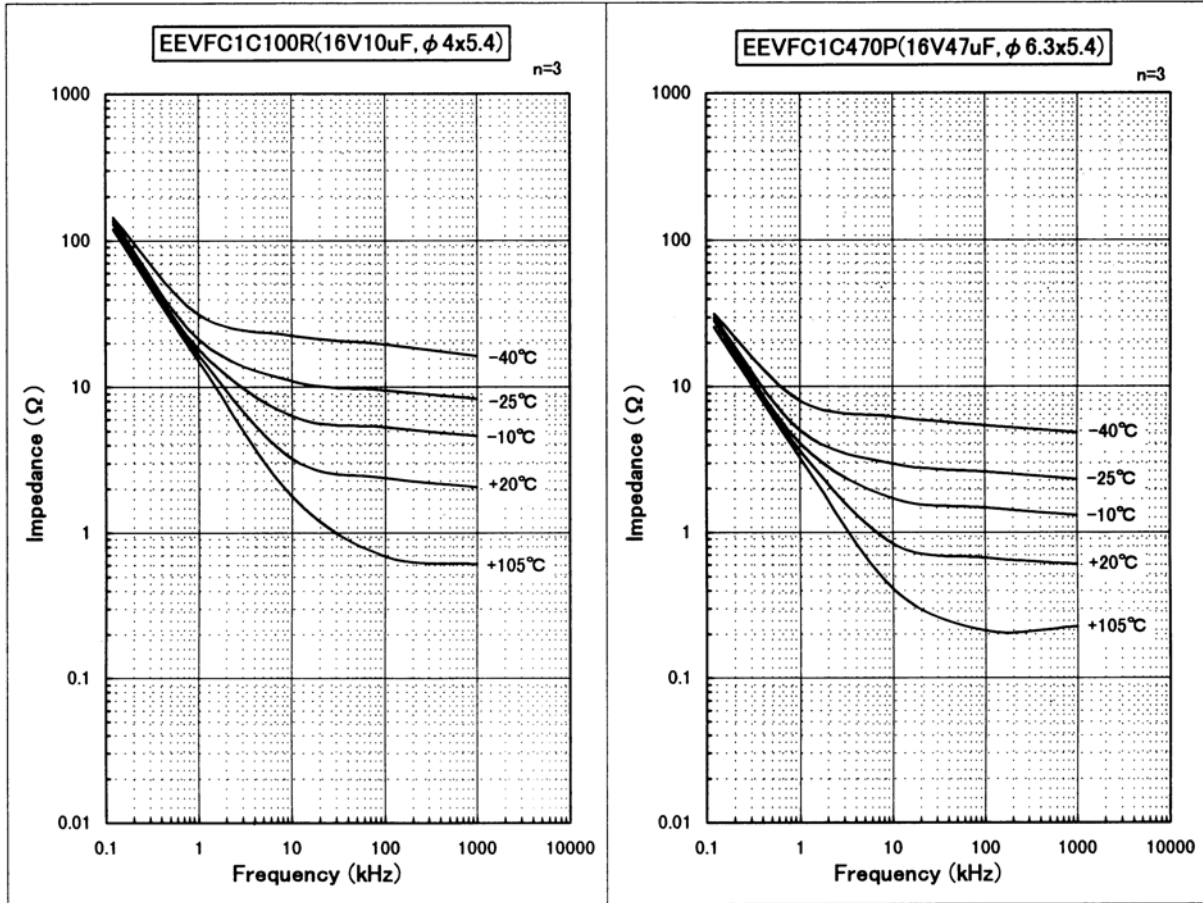
Endurance



Frequency Characteristics



Temperature Characteristics



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

