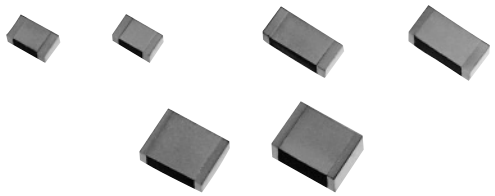
Stacked Metallized PPS Film Chip Capacitor

Type: ECHU(X)

Stacked metallized PPS film as dielectric with simple mold-less construction



■Features

- Small in size (minimum size 1.6 mm × 0.8 mm)
- 85 ℃, 85 %RH, W.V. × 1.0 for 500 hours
- For reflow soldering
- RoHS directive compliant

■Recommended Applications

- Time-constant
- Filtering
- Oscillation and resonance

■Explanation of Part Numbers

1	2	3	4	5	6	7	8	9	10	11	12
E	C	H	U							X	

Product code: E C

Dielectric & construction: H U

Rated voltage:

1C	16 VDC
1H	50 VDC

Capacitance: 5 6 7 8 9

Cap. Tol.: 10

G	±2 %
J	±5 %

Suffix: 11 = X

Suffix: 12

	Tape width / Reel diameter
5	8 mm / size ø180 mm
9	12 mm / size ø330 mm

❊ Tape width 8 mm and diameter ø330 mm reel is prepared.

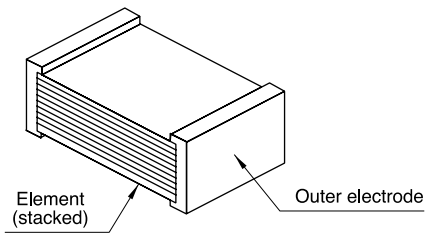
■Specifications

Category temp. range (Including temperature-rise on unit surface)	−55 ℃ to +125 ℃
Rated voltage	16 VDC, 50 VDC (50 VDC: 0.12 µF or more: Derating or rated voltage by 1.25 % / ℃ at more than 105 ℃)
Capacitance range	0.00010 µF to 0.22 µF (E12)
Capacitance tolerance	±2 %(G), ±5 %(J)
Withstand voltage	Between terminals : Rated volt. (VDC)×150 % 60 s
Dissipation factor (tanδ)	tan δ ≦0.6 % (20 ℃, 1 kHz)
Insulation resistance (IR)	16 VDC : IR≧3000 MΩ (20 ℃, 10 VDC, 60 s) 50 VDC : IR≧3000 MΩ (20 ℃, 50 VDC, 60 s)
Soldering conditions	Reflow soldering : 260 ℃ max. and 95 sec max. at more than 220 ℃ (Temp. at cap. surface)

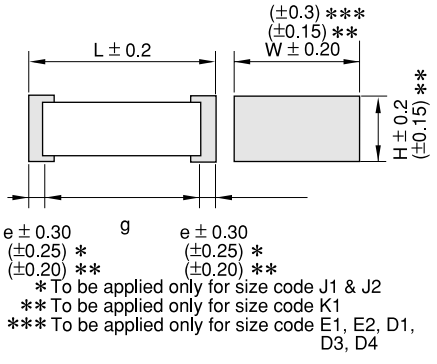
❊ Please consult us for flow soldering

❊ In case of applying voltage in alternating current (50 Hz or 60 Hz sine wave) to a capacitor with DC rated voltage, please refer to the page of “Permissible voltage (R.M.S) in alternating current corresponding to DC rated voltage”.

■Construction



■Dimensions in mm (not to scale)



∗ To be applied only for size code J1 & J2
∗∗ To be applied only for size code K1
∗∗∗ To be applied only for size code E1, E2, D1, D3, D4

saize code	L	W	H	e	g
K1	1.6	0.8	0.7	0.35	≧0.4
J1	2.0	1.25	0.9	0.45	≧0.6
J2	2.0	1.25	1.1	0.45	≧0.6
H1	3.2	1.6	0.9	0.65	≧1.0
H2	3.2	1.6	1.1	0.65	≧1.0
H3	3.2	1.6	1.5	0.65	≧1.0
G1	3.2	2.5	1.1	0.65	≧1.0
G2	3.2	2.5	1.5	0.65	≧1.0
G3	3.2	2.5	2.1	0.65	≧1.0
E1	4.8	3.3	1.5	0.80	≧2.0
E2	4.8	3.3	2.1	0.80	≧2.0
D1	6.0	4.1	1.9	0.80	≧2.0
D3	6.0	4.1	2.5	0.80	≧2.0
D4	6.0	4.1	2.8	0.80	≧2.0

Design, Specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.
Whenever a doubt about safety arises from this product, please inform us immediately for technical consultation without fail.

■Taping Specification for Automatic Mounting
Refer to the page of taping specifications

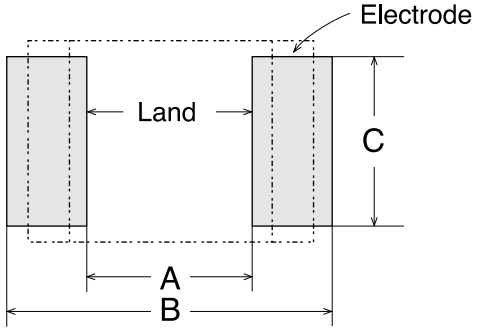
■Rating, Dimensions & Quantity/Reel

●Capacitance tolerance : ±2 %(G), ±5 %(J)

Cap. (μF)	Rated volt. 16 VDC						Rated volt. 50 VDC					
	Part No.	Dimensions (mm)			Size Code	Q'ty	Part No.	Dimensions (mm)			Size Code	Q'ty
		L	W	H				L	W	H		
0.00010	ECHU1C101□X5	1.6	0.8	0.7	K1	4000	ECHU1H101□X5	2.0	1.25	0.9	J1	3000
0.00012	ECHU1C121□X5	1.6	0.8	0.7	K1		ECHU1H121□X5	2.0	1.25	0.9	J1	
0.00015	ECHU1C151□X5	1.6	0.8	0.7	K1		ECHU1H151□X5	2.0	1.25	0.9	J1	
0.00018	ECHU1C181□X5	1.6	0.8	0.7	K1		ECHU1H181□X5	2.0	1.25	0.9	J1	
0.00022	ECHU1C221□X5	1.6	0.8	0.7	K1		ECHU1H221□X5	2.0	1.25	0.9	J1	
0.00027	ECHU1C271□X5	1.6	0.8	0.7	K1		ECHU1H271□X5	2.0	1.25	0.9	J1	
0.00033	ECHU1C331□X5	1.6	0.8	0.7	K1		ECHU1H331□X5	2.0	1.25	0.9	J1	
0.00039	ECHU1C391□X5	1.6	0.8	0.7	K1		ECHU1H391□X5	2.0	1.25	0.9	J1	
0.00047	ECHU1C471□X5	1.6	0.8	0.7	K1		ECHU1H471□X5	2.0	1.25	0.9	J1	
0.00056	ECHU1C561□X5	1.6	0.8	0.7	K1		ECHU1H561□X5	2.0	1.25	0.9	J1	
0.00068	ECHU1C681□X5	1.6	0.8	0.7	K1		ECHU1H681□X5	2.0	1.25	0.9	J1	
0.00082	ECHU1C821□X5	1.6	0.8	0.7	K1		ECHU1H821□X5	2.0	1.25	0.9	J1	
0.0010	ECHU1C102□X5	1.6	0.8	0.7	K1		ECHU1H102□X5	2.0	1.25	0.9	J1	
0.0012	ECHU1C122□X5	1.6	0.8	0.7	K1		ECHU1H122□X5	2.0	1.25	0.9	J1	
0.0015	ECHU1C152□X5	1.6	0.8	0.7	K1		ECHU1H152□X5	2.0	1.25	0.9	J1	
0.0018	ECHU1C182□X5	1.6	0.8	0.7	K1		ECHU1H182□X5	2.0	1.25	0.9	J1	
0.0022	ECHU1C222□X5	1.6	0.8	0.7	K1		ECHU1H222□X5	2.0	1.25	0.9	J1	
0.0027	ECHU1C272□X5	1.6	0.8	0.7	K1		ECHU1H272□X5	2.0	1.25	0.9	J1	
0.0033	ECHU1C332□X5	2.0	1.25	0.9	J1	3000	ECHU1H332□X5	3.2	1.6	0.9	H1	
0.0039	ECHU1C392□X5	2.0	1.25	0.9	J1		ECHU1H392□X5	3.2	1.6	0.9	H1	
0.0047	ECHU1C472□X5	2.0	1.25	0.9	J1		ECHU1H472□X5	3.2	1.6	0.9	H1	
0.0056	ECHU1C562□X5	2.0	1.25	0.9	J1		ECHU1H562□X5	3.2	1.6	0.9	H1	
0.0068	ECHU1C682□X5	2.0	1.25	0.9	J1		ECHU1H682□X5	3.2	1.6	0.9	H1	
0.0082	ECHU1C822□X5	2.0	1.25	1.1	J2		ECHU1H822□X5	3.2	1.6	1.1	H2	
0.010	ECHU1C103□X5	2.0	1.25	1.1	J2		ECHU1H103□X5	3.2	1.6	1.1	H2	
0.012	ECHU1C123□X5	3.2	1.6	0.9	H1		ECHU1H123□X5	3.2	2.5	1.1	G1	2000
0.015	ECHU1C153□X5	3.2	1.6	0.9	H1		ECHU1H153□X5	3.2	2.5	1.1	G1	
0.018	ECHU1C183□X5	3.2	1.6	0.9	H1		ECHU1H183□X5	3.2	2.5	1.5	G2	
0.022	ECHU1C223□X5	3.2	1.6	0.9	H1		ECHU1H223□X5	3.2	2.5	1.5	G2	
0.027	ECHU1C273□X5	3.2	1.6	1.1	H2		ECHU1H273□X5	3.2	2.5	1.5	G2	
0.033	ECHU1C333□X5	3.2	1.6	1.1	H2		ECHU1H333□X5	3.2	2.5	2.1	G3	
0.039	ECHU1C393□X5	3.2	1.6	1.5	H3	2000	ECHU1H393□X5	3.2	2.5	2.1	G3	
0.047	ECHU1C473□X5	3.2	1.6	1.5	H3		ECHU1H473□X9	4.8	3.3	1.5	E1	3000
0.056	ECHU1C563□X5	3.2	2.5	1.5	G2		ECHU1H563□X9	4.8	3.3	1.5	E1	
0.068	ECHU1C683□X5	3.2	2.5	1.5	G2		ECHU1H683□X9	4.8	3.3	1.5	E1	
0.082	ECHU1C823□X5	3.2	2.5	2.1	G3		ECHU1H823□X9	4.8	3.3	2.1	E2	
0.10	ECHU1C104□X5	3.2	2.5	2.1	G3		ECHU1H104□X9	4.8	3.3	2.1	E2	
0.12							ECHU1H124□X9	6.0	4.1	1.9	D1	
0.15							ECHU1H154□X9	6.0	4.1	1.9	D1	
0.18							ECHU1H184□X9	6.0	4.1	2.5	D3	2000
0.22							ECHU1H224□X9	6.0	4.1	2.8	D4	

Cap. tol. code

■Recommended for Land Dimensions (mm)



Size Code	Land dimensions		
	Reflow soldering		
	A	B	C
K1	0.6	2.0	0.7
J1,J2	0.8	2.4	1.1
H1,H2,H3	1.8	3.6	1.4
G1,G2,G3	1.8	3.6	2.3
E1,E2	3.0	5.6	3.0
D1,D3,D4	4.0	7.0	3.8

❊ It is not warrantable that you can mount the capacitor without trouble under all the mounting condition when "Recommender for Land dimensions" is adopted.

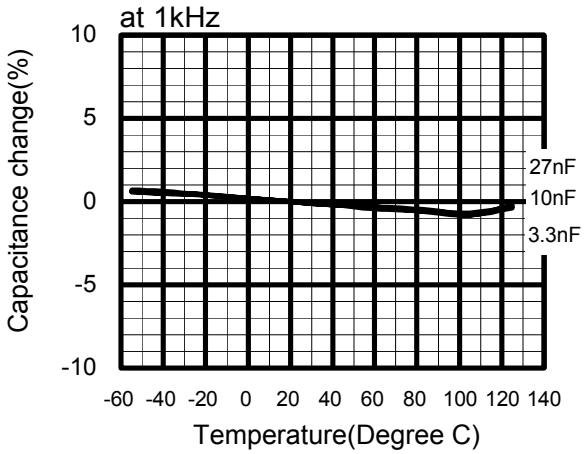
Design, Specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.
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Panasonic

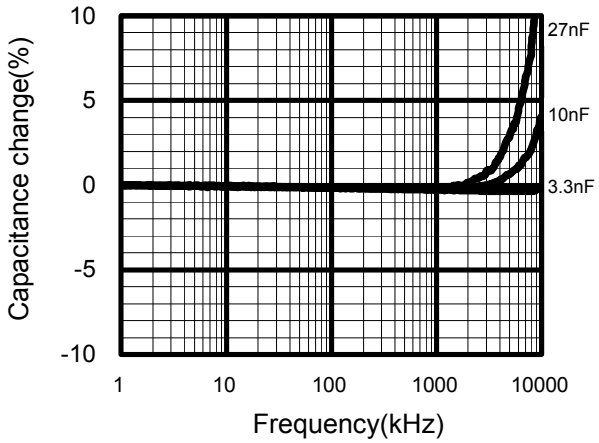
ECHU (X) Type DC10V series (Stacked Metallized Film)

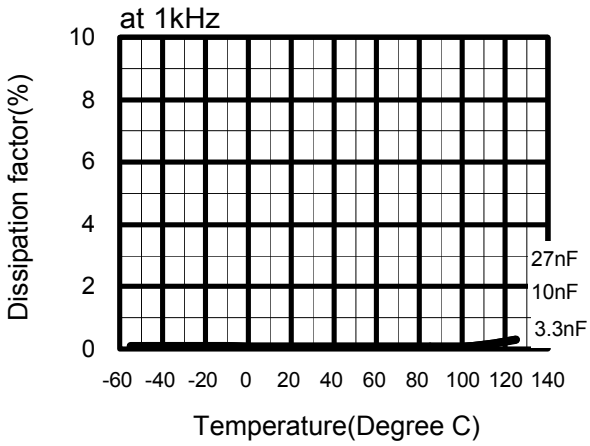
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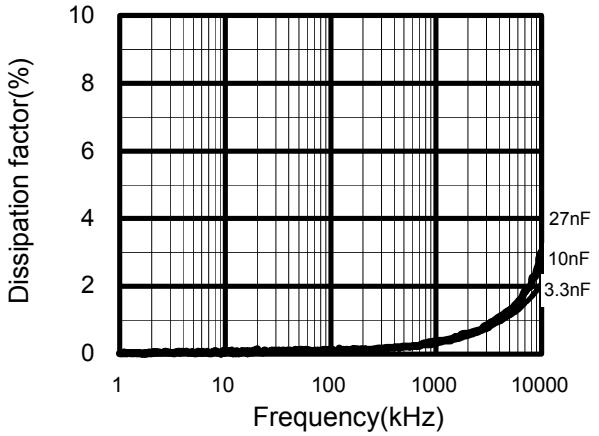
Temperature Characteristics

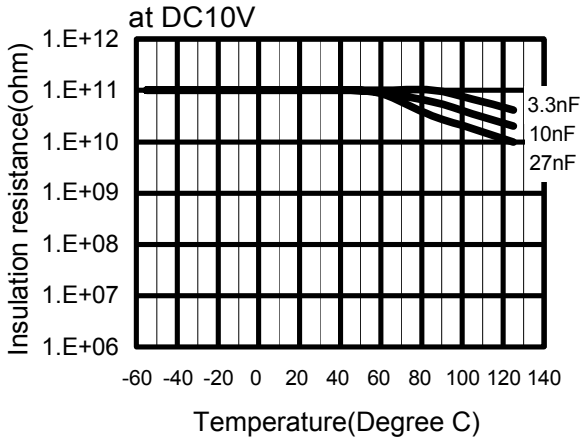


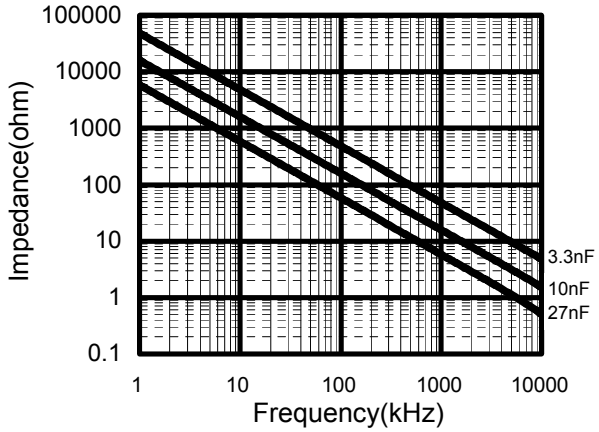
Frequency Characteristics









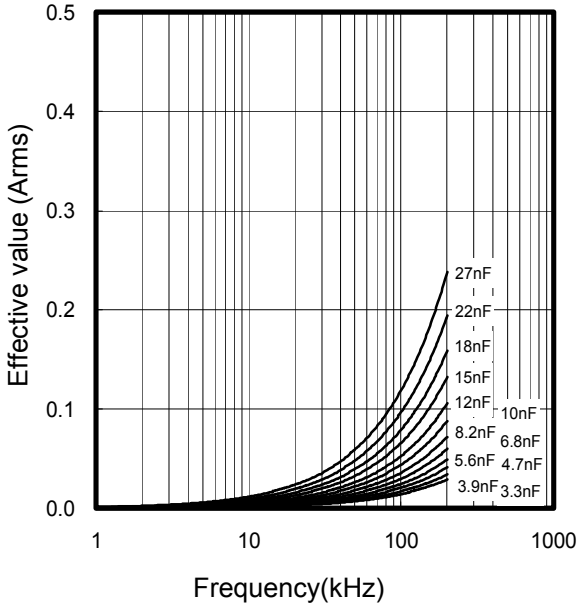


Panasonic

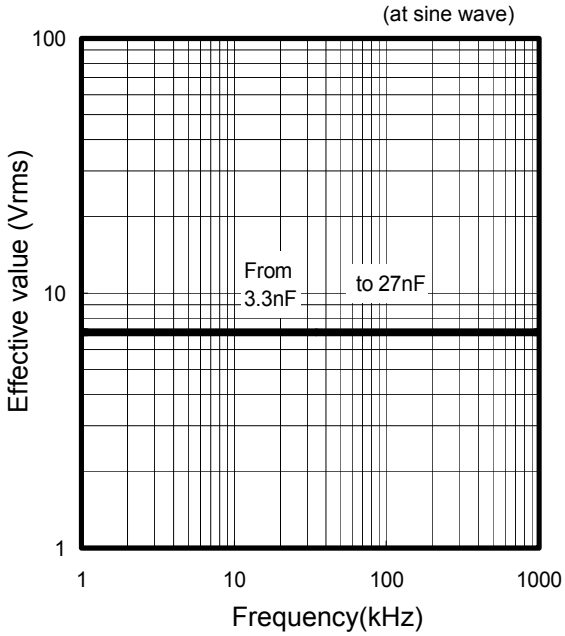
ECHU (X) Type DC10V series (Stacked Metallized Film)

Applicable Specifications

Permissible Current



Permissible Voltage

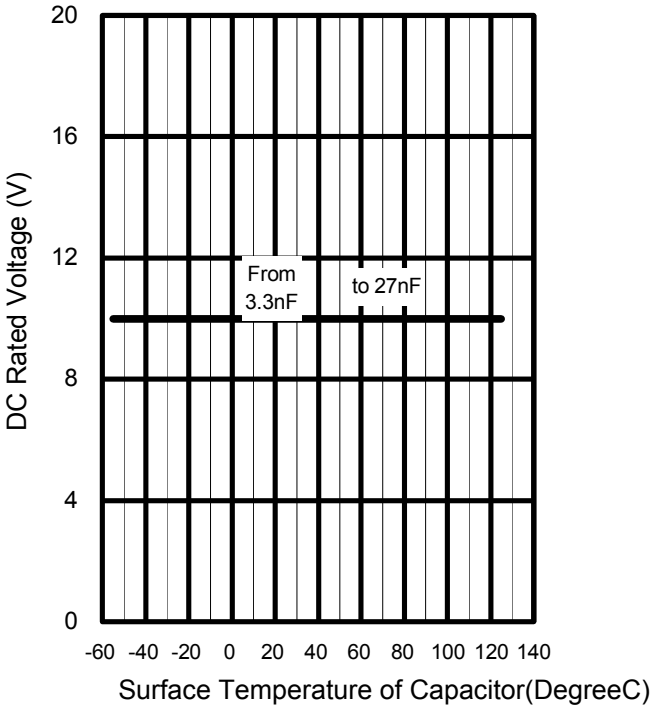


Pulse Handling Capability (dv/dt)

(Max 10000cycles)

Rating Voltage	Capacitance Value(uF)	code	dV/dt (V/us)	Current(0-P) (A)
DC 10V	0.0033	332	47	0.16
	0.0039	392	44	0.17
	0.0047	472	40	0.19
	0.0056	562	37	0.21
	0.0068	682	34	0.23
	0.0082	822	31	0.25
	0.01	103	28	0.28
	0.012	123	26	0.31
	0.015	153	24	0.36
	0.018	183	22	0.40
	0.022	223	20	0.44
	0.027	273	18	0.49

Voltage Derating by Temperature



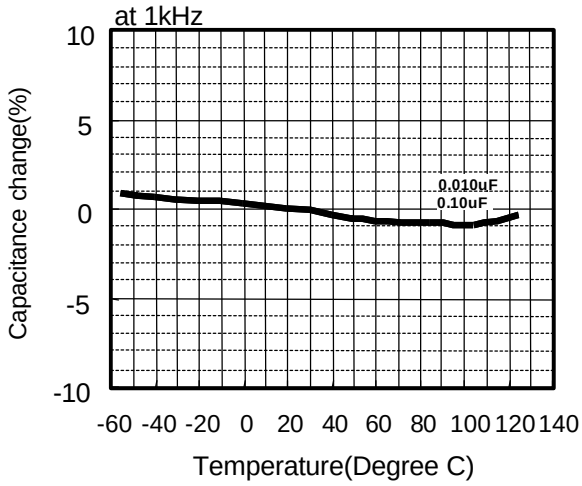
* Please consult Panasonic if your condition exceeds the above
*Permissible voltage graph is the case of sine waveform. When you use this product, peak voltage must not exceed DC rated voltage.
*The current(0-P) value is calculated using nominal capacitance.

Panasonic

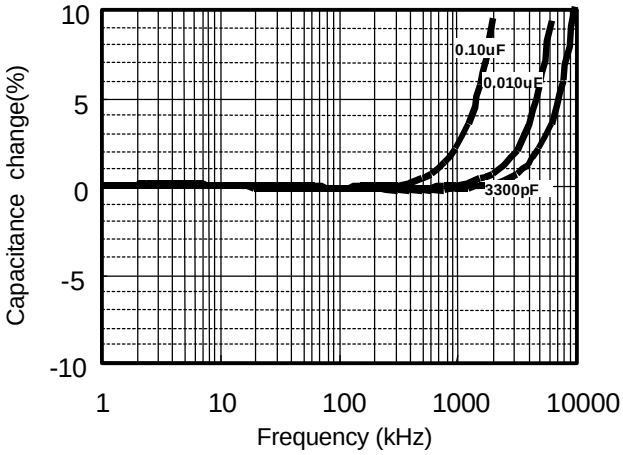
ECHU (X) Type DC16V series (Stacked Metallized Film)

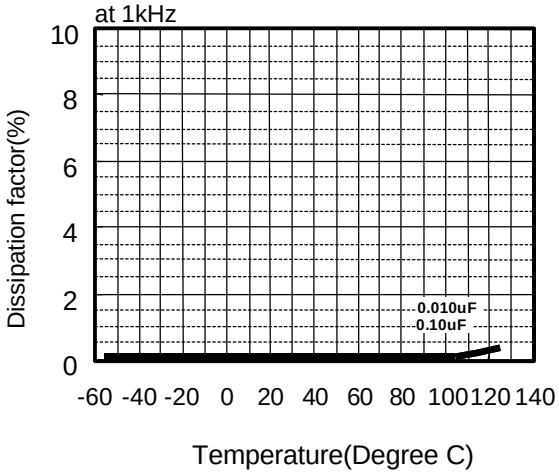
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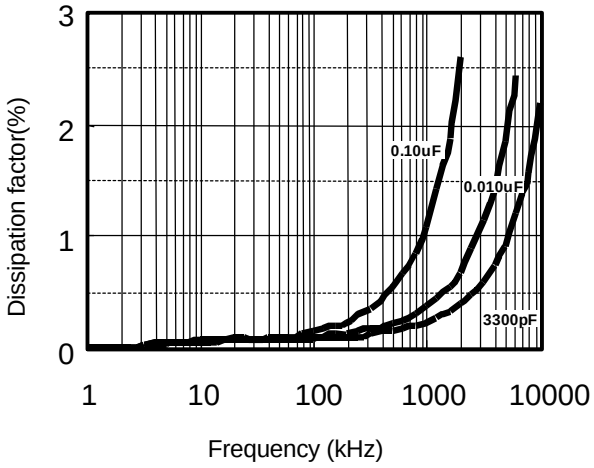
Temperature Characteristics

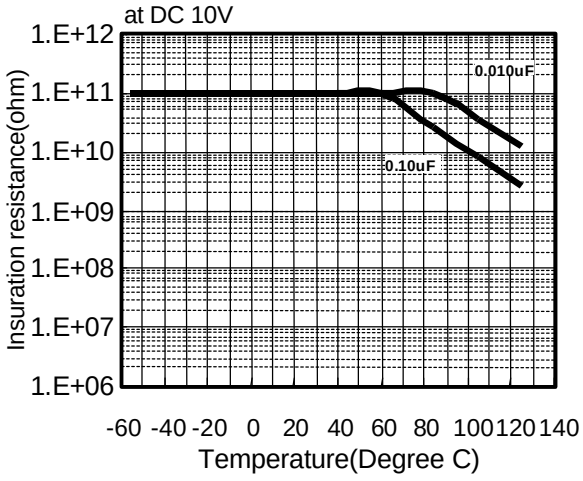


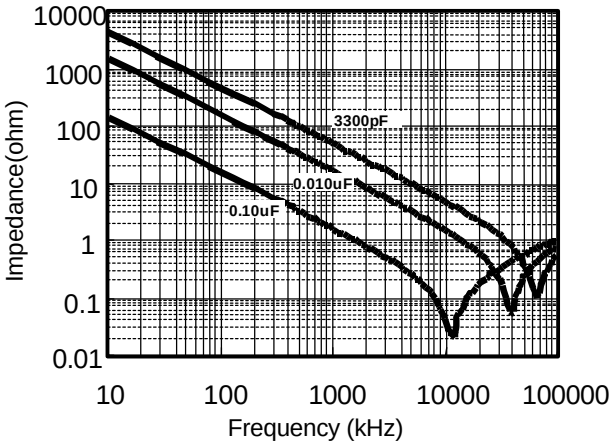
Frequency Characteristics









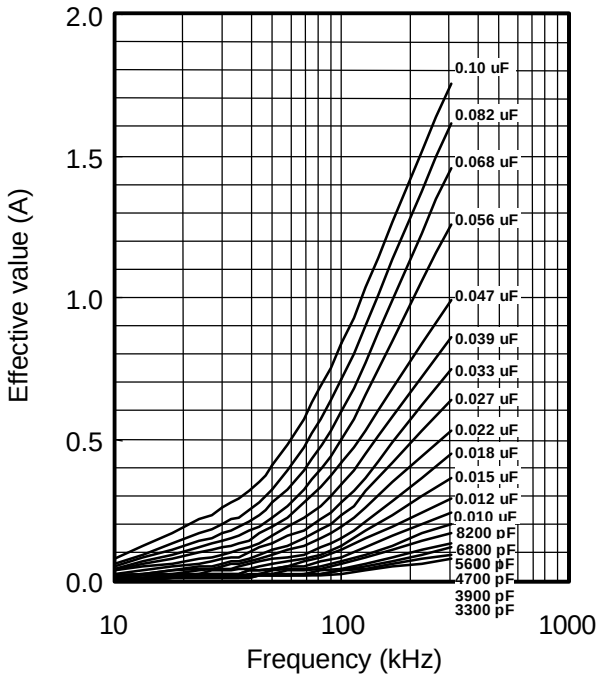


Panasonic

ECHU (X) Type DC16V series (Stacked Metallized Film)

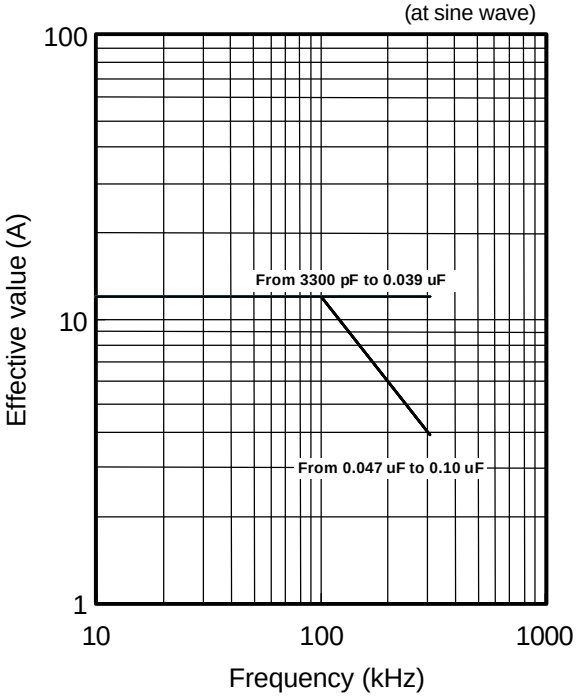
Applicable Specifications

Permissible Current



Permissible Voltage

(at sine wave)

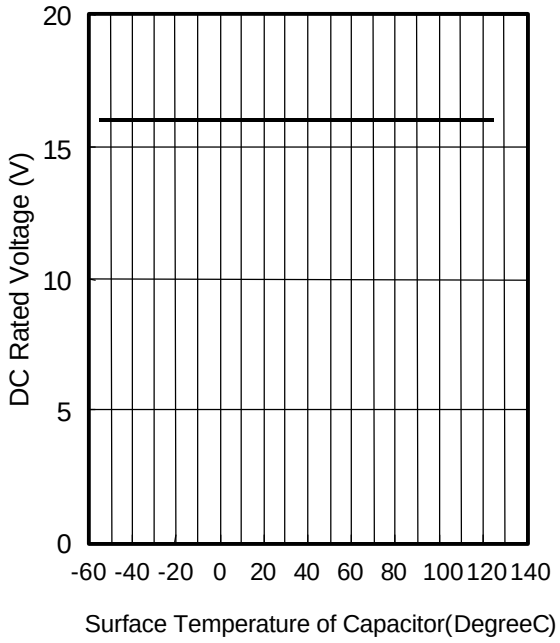


Pulse Handling Capability (dv/dt)

(Max 10000cycles)

Rating Voltage	Capacitance Value(uF)	Code	dv/dt(V/us)	Current($_{0\text{-}P}$) (A)
DC 16V	0.0033	332	86	0.28
	0.0039	392	80	0.31
	0.0047	472	74	0.35
	0.0056	562	68	0.38
	0.0068	682	62	0.42
	0.0082	822	58	0.48
	0.010	103	52	0.52
	0.012	123	48	0.58
	0.015	153	43	0.65
	0.018	183	40	0.72
	0.022	223	37	0.81
	0.027	273	33	0.89
	0.033	333	31	1.02
	0.039	393	28	1.09
	0.047	473	26	1.22
	0.056	563	24	1.34
	0.068	683	22	1.50
	0.082	823	20	1.64
	0.10	104	19	1.90

Voltage Derating by Temperature



* Please consult Panasonic if your condition exceeds the above spec.

*Permissible voltage graph is the case of sine waveform. When you use this product, peak voltage must not exceed DC rated voltage.

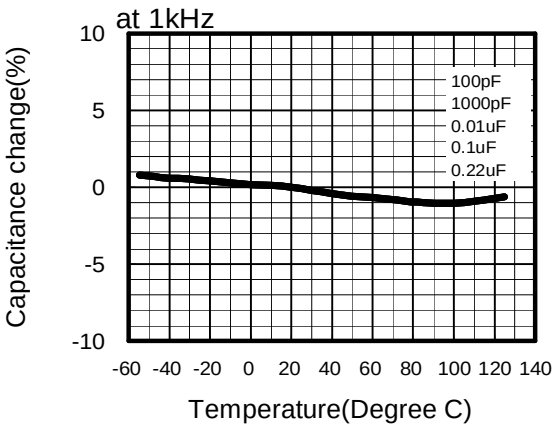
*The current($_{0\text{-}P}$) value is calculated using nominal capacitance.

Panasonic

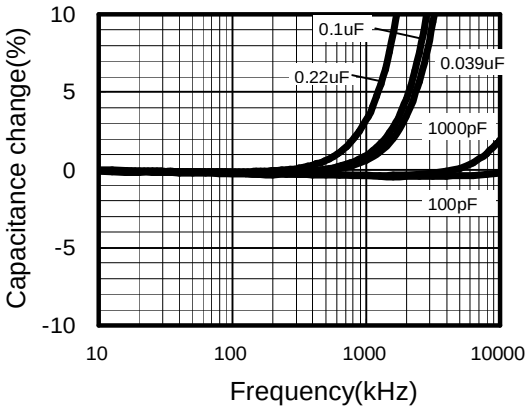
ECHU (X) Type DC50V series (Stacked Metallized Film)

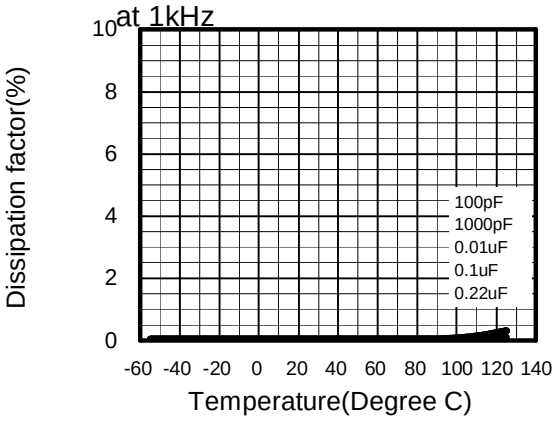
Electrical Characteristics <Typical Data >

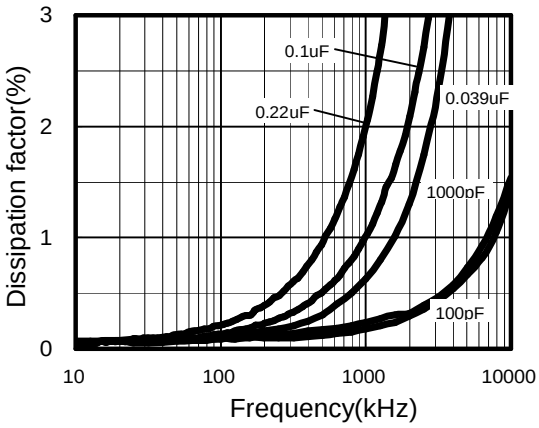
Temperature Characteristics

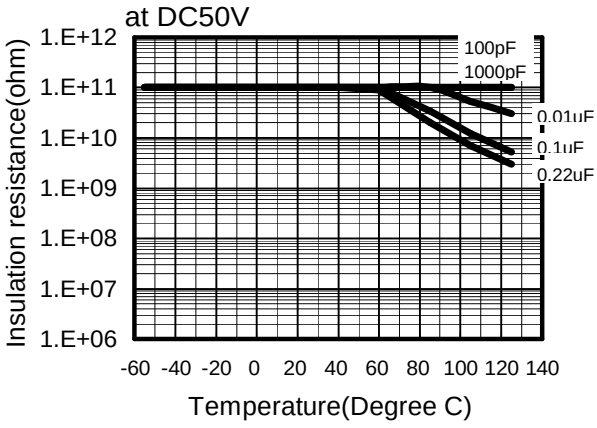


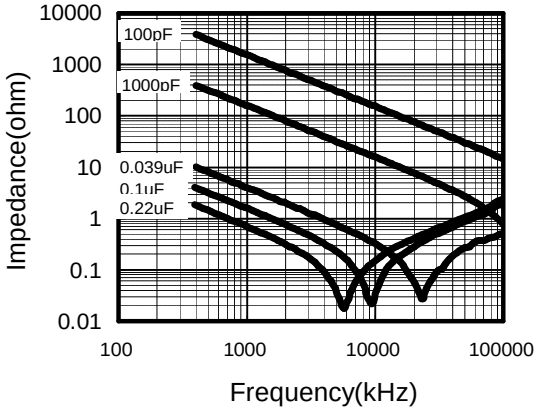
Frequency Characteristics









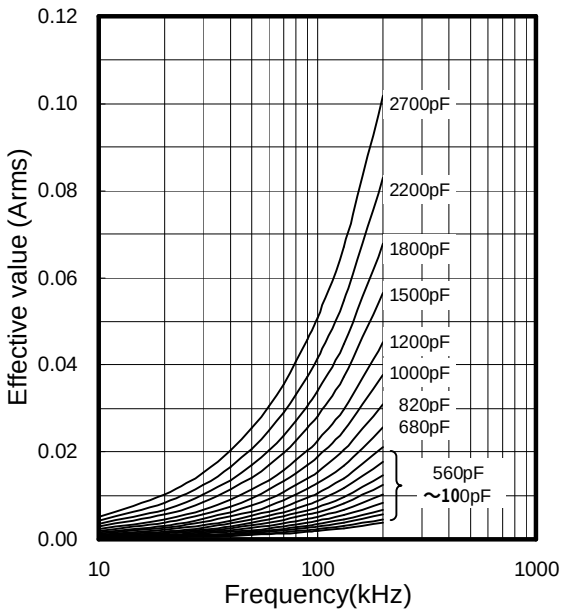


Panasonic

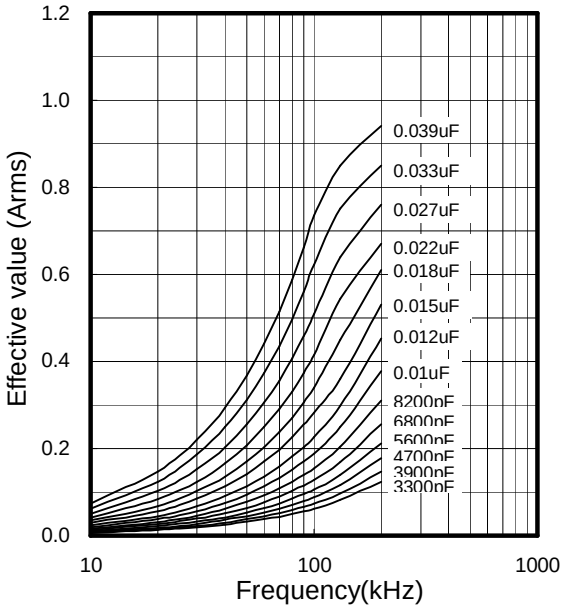
ECHU (X) Type DC50V series (Stacked Metallized Film)

Applicable Specifications

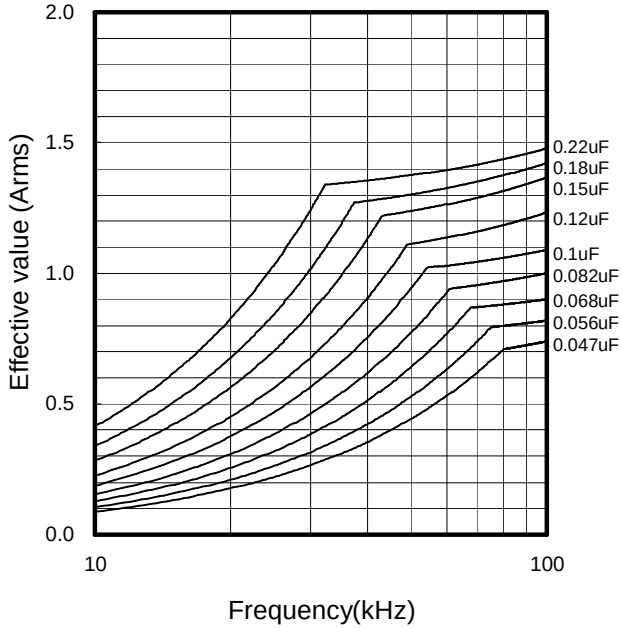
Permissible Current



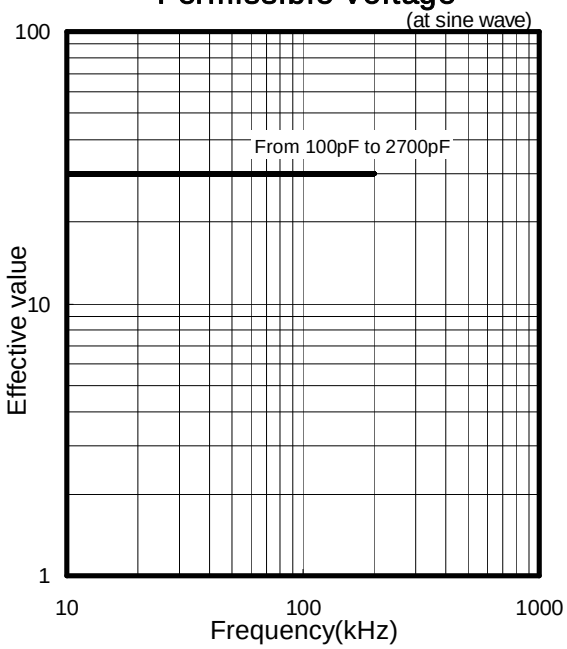
Permissible Current



Permissible Current



Permissible Voltage



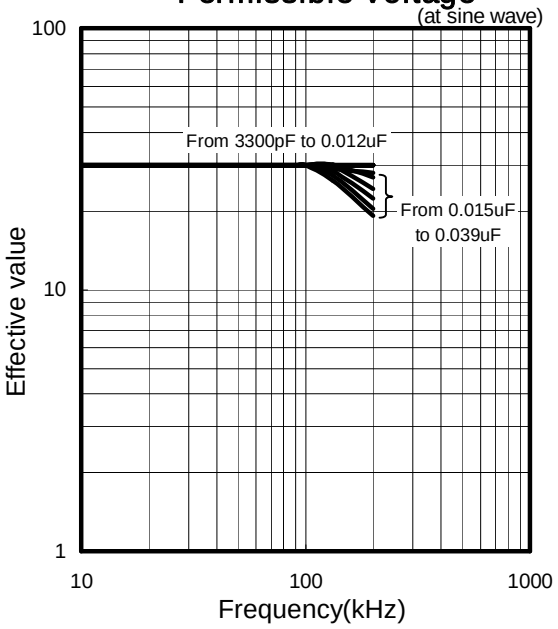
*Please consult Panasonic if your condition exceeds the above
*Permissible voltage graph is the case of sine waveform. When you use this product, peak voltage must not exceed DC rated voltage.
*The current(0-P) vlue is calculated using nominal capacitance.

Panasonic

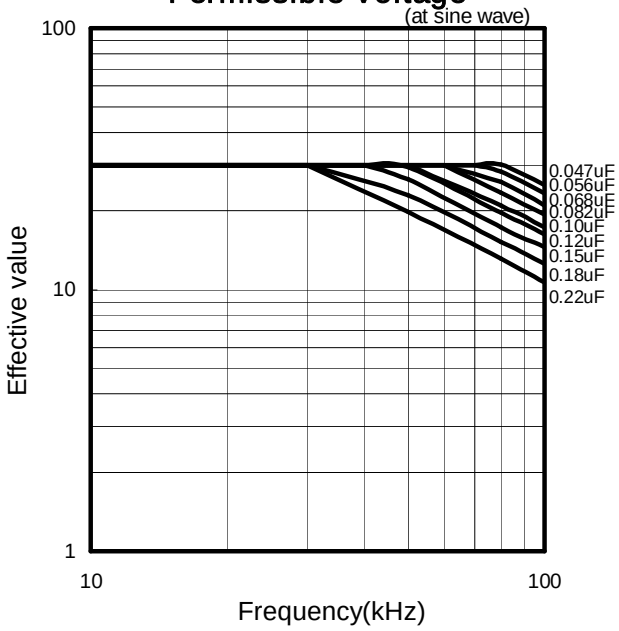
ECHU (X) Type DC50V series (Stacked Metallized Film)

Applicable Specifications

Permissible Voltage



Permissible Voltage



Pulse Handling Capability (dv/dt)

(Max 10000cycles)

Rating Voltage	Capacitance Value(uF)	code	dV/dt (V/us)	Current (Ao-p)
DC 50V	0.00010	101	1100	0.11
	0.00012	121	1050	0.13
	0.00015	151	940	0.14
	0.00018	181	890	0.16
	0.00022	221	800	0.18
	0.00027	271	730	0.20
	0.00033	331	690	0.23
	0.00039	391	610	0.24
	0.00047	471	580	0.27
	0.00056	561	520	0.29
	0.00068	681	480	0.33
	0.00082	821	440	0.36
	0.0010	102	400	0.40
	0.0012	122	370	0.44
	0.0015	152	340	0.51
	0.0018	182	310	0.56
	0.0022	222	270	0.59
	0.0027	272	260	0.70

Pulse Handling Capability (dv/dt)

(Max 10000cycles)

Rating Voltage	Capacitance Value(uF)	code	dV/dt (V/us)	Current (Ao-p)
DC 50V	0.0033	332	240	0.79
	0.0039	392	220	0.86
	0.0047	472	200	0.94
	0.0056	562	190	1.06
	0.0068	682	170	1.16
	0.0082	822	160	1.31
	0.010	103	145	1.45
	0.012	123	135	1.62
	0.015	153	120	1.80
	0.018	183	110	1.98
	0.022	223	100	2.20
	0.027	273	94	2.54
	0.033	333	86	2.84
	0.039	393	78	3.04

*Please consult Panasonic if your condition exceeds the above
*Permissible voltage graph is the case of sine waveform. When you use this product, peak voltage must not exceed DC rated voltage.
*The current(0-P) value is calculated using nominal capacitance.

Panasonic

ECHU (X) Type DC50V series (Stacked Metallized Film)

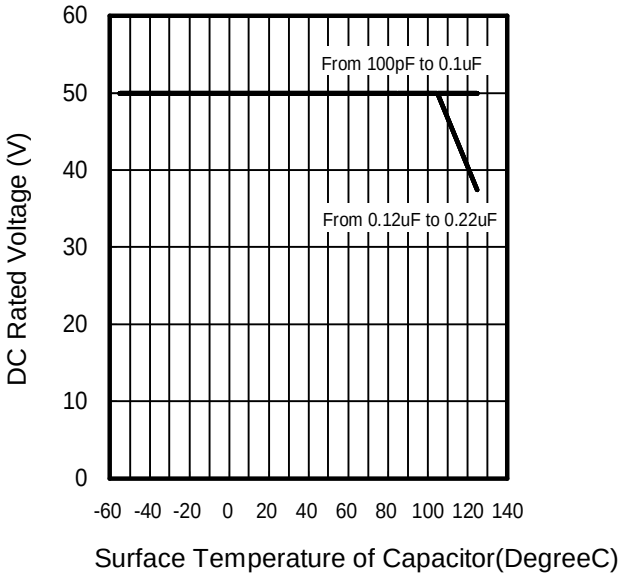
Applicable Specifications

Pulse Handling Capability (dv/dt)

(Max 10000cycles)

Rating Voltage	Capacitance Value(uF)	code	dV/dt (V/us)	Current (Ao-p)
DC 50V	0.047	473	72	3.38
	0.056	563	68	3.81
	0.068	683	62	4.22
	0.082	823	56	4.59
	0.10	104	52	5.20
	0.12	124	48	5.76
	0.15	154	44	6.60
	0.18	184	40	7.20
	0.22	224	36	7.92

Voltage Derating by Temperature



*Please consult Panasonic if your condition exceeds the above
*Permissible voltage graph is the case of sine waveform. When you use this product, peak voltage must not exceed DC rated voltage.
*The current(0-P) value is calculated using nominal capacitance.