



HS-CON™

Aluminum Electrolytic Capacitor with Hybrid Semiconductor

HVH Series

New!

HVP Series

New!

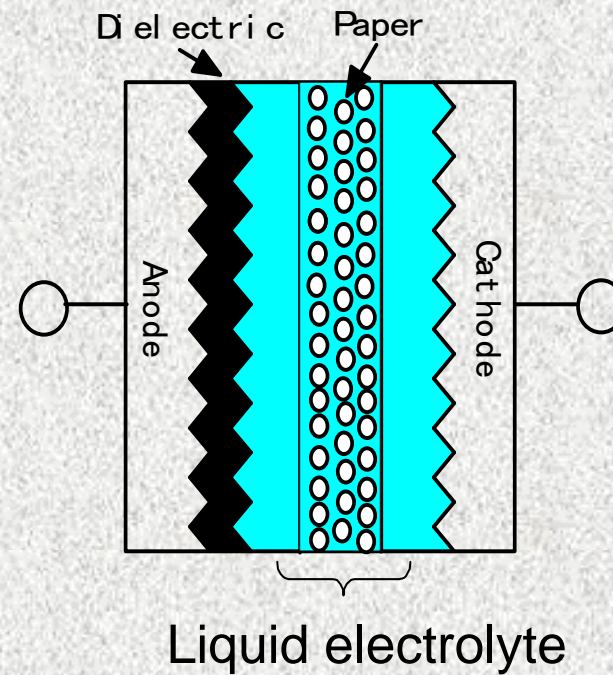
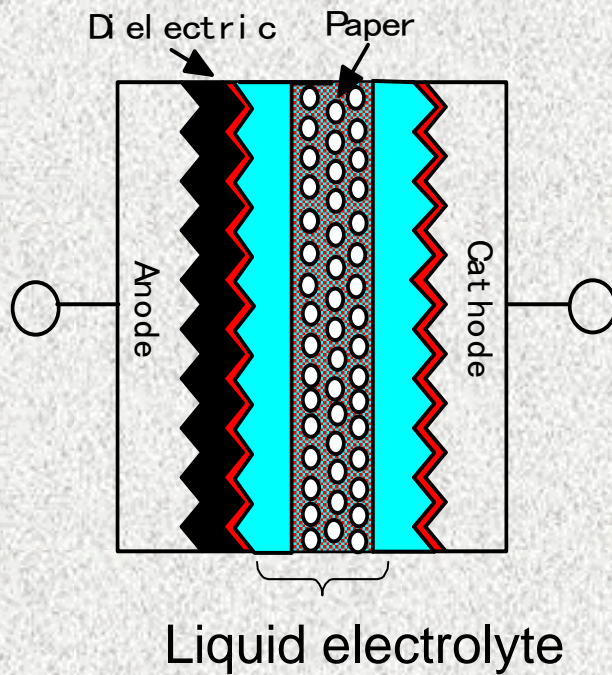
Oct.2007
Electronic Device Company
Marketing Center

1. Features

Structure

HS-CON™

E-CAP



+
Conductive Polymer (Solid)

Features

- ① High conductive electrolyte (solid conductive polymer) is combined.



Low ESR at high frequency
(Downsize and upgrade your circuit !)

- ② The electrolyte is not dependent on temperature.



Excellent temperature characteristics
(Stable performance at wide temperature range !)

- ③ Self-healing property of liquid electrolyte



Compared to solid capacitors, short circuit mode seldom happen and L.C. is lower.

Features

- ④ Rated voltage is up to 63V and 85°C x 85%RH is guaranteed.



High voltage and High reliability !

Top level in the industry!

- ⑤ Applying a voltage up to the rated voltage is guaranteed.



Voltage derating is not needed !

- ⑥ ROHS compliance and lead-free



Environmental friendly !

Features

⑦ Long life



High reliability

HVH Series (105°C Product)

D=6.3 105°C × 5000hrs.

D=8、10 105°C × 10000hrs.(25V : 7000hrs.)

HVP Series (125°C Product)

D=6.3 125°C × 2000hrs.(25V : 1500hrs.)

D=8、10 125°C × 3000hrs.(25V : 2500hrs.)

2. Main Target Application

Main Target Application

- **Automotive electric**
- **Network**
- **Industrial**
- **Flat-TV (LCD, PDP etc.)**
- **Power supply (Inverter etc.)**
- **Server**

3. Series Diagram

Series Diagram

105°C

HVA

125°C

HVB

- Higher voltage*
- Longer life*
- Lower L.C.*

105°C

HVH

125°C

HVP

New!

New!

Model List

HVH

■ Size List (mm) ESR[mΩ/100kHz, 20°C] Rated ripple current[mA r.m.s./100kHz, 105°C]

V μF	25			35			50			63		
	Case size (φD×L)	ESR	Ripple current	Case size (φD×L)	ESR	Ripple current	Case size (φD×L)	ESR	Ripple current	Case size (φD×L)	ESR	Ripple current
2.7										6.3×6.0	150	960
3.9										6.3×7.7	100	1060
5.6							6.3×6.0	120	980			
10							6.3×7.7	80	1200			
22										8×10.5	40	1560
27				6.3×6.0	100	1080						
33							8×10.5	35	1670	10×10.5	30	2100
47	6.3×6.0	60	1270	6.3×7.7	60	1300						
56							10×10.5	25	2320			
68	6.3×7.7	45	1400									
100				8×10.5	30	1800						
150	8×10.5	27	1900	10×10.5	23	2470						
270	10×10.5	22	2530									

HVP




■ Size List (mm) ESR[mΩ/100kHz, 20°C] Rated ripple current[mA r.m.s./100kHz, 125°C]

V μF	25			35			50			63		
	Case size (φD×L)	ESR	Ripple current	Case size (φD×L)	ESR	Ripple current	Case size (φD×L)	ESR	Ripple current	Case size (φD×L)	ESR	Ripple current
3.9										6.3×7.7	100	740
10							6.3×7.7	80	840			
22										8×10.5	40	1090
33							8×10.5	35	1170	10×10.5	30	1260
47				6.3×7.7	60	910						
56							10×10.5	25	1390			
68	6.3×7.7	45	980									
100				8×10.5	30	1260						
150	8×10.5	27	1330	10×10.5	23	1480						
270	10×10.5	22	1520									

4. Characteristics




SPEC comparison to Low ESR E-CAP

Rated Voltage: 25V

CASE SIZE	HVH series	CE-KX series
D6.3 x 6 	60mOhm 1270mA 47uF	390mOhm 250mA 68uF
D8x10.5 	27mOhm 1900mA 150uF	150mOhm 600mA 330uF
D10x10.5 	22mOhm 2530mA 270uF	80mOhm 850mA 470uF




SPEC comparison to Low ESR E-CAP

Rated Voltage : 35V

CASE SIZE	HVH series	CE-KX series
D6.3 x 6 	100mOhm 1080mA 27uF	390mOhm 250mA 47uF
D8x10.5 	30mOhm 1800mA 100uF	150mOhm 600mA 220uF
D10x10.5 	23mOhm 2470mA 150uF	80mOhm 850mA 330uF

SPEC comparison to Low ESR E-CAP

Rated Voltage : 50V

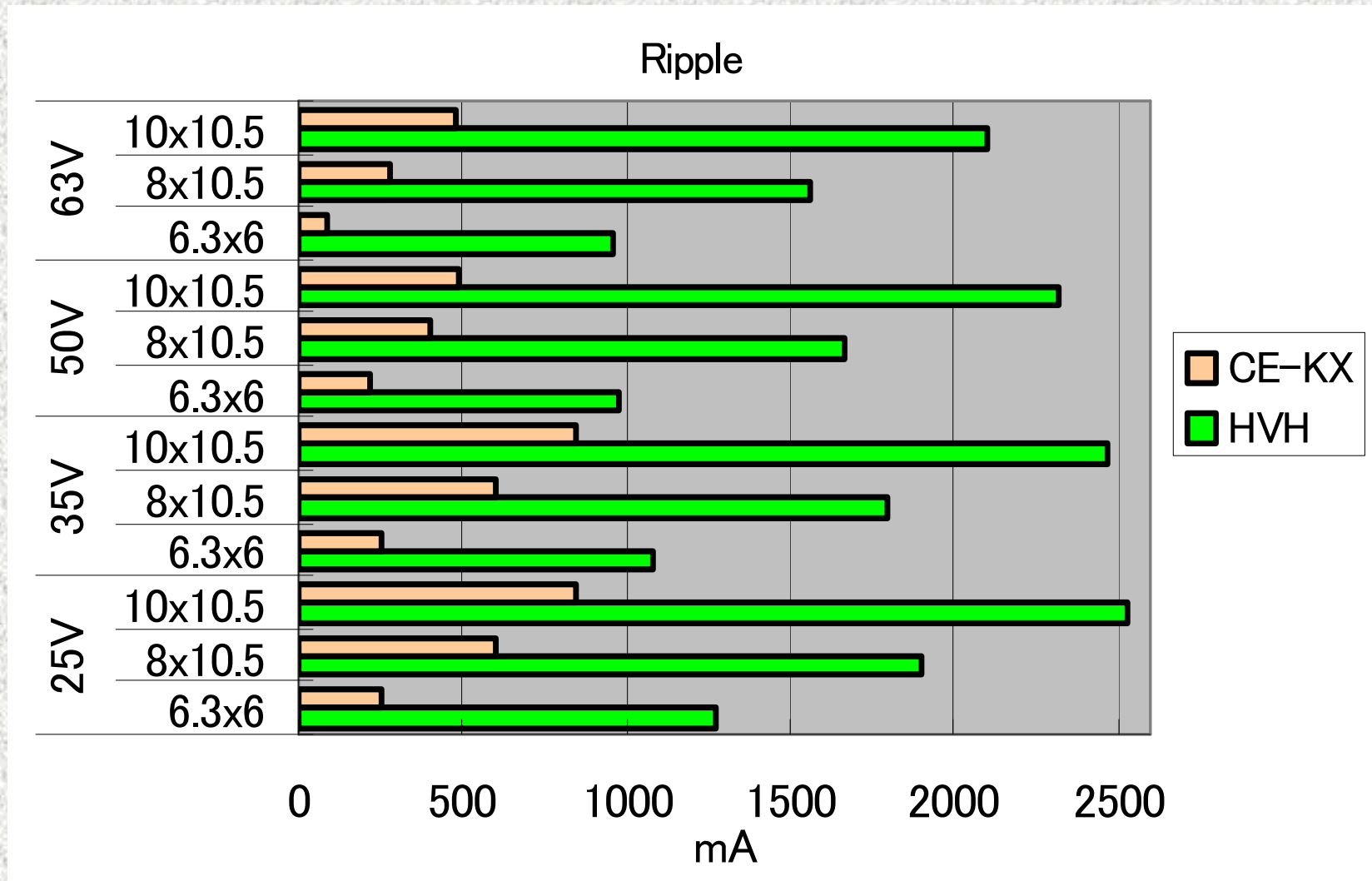
CASE SIZE	HVH series	CE-KX series
D6.3 x 6 	120mOhm 980mA 5.6uF	520mOhm 215mA 22uF
D8x10.5 	35mOhm 1670mA 33uF	220mOhm 400mA 100uF
D10x10.5 	25mOhm 2320mA 56uF	130mOhm 485mA 220uF

SPEC comparison to Low ESR E-CAP

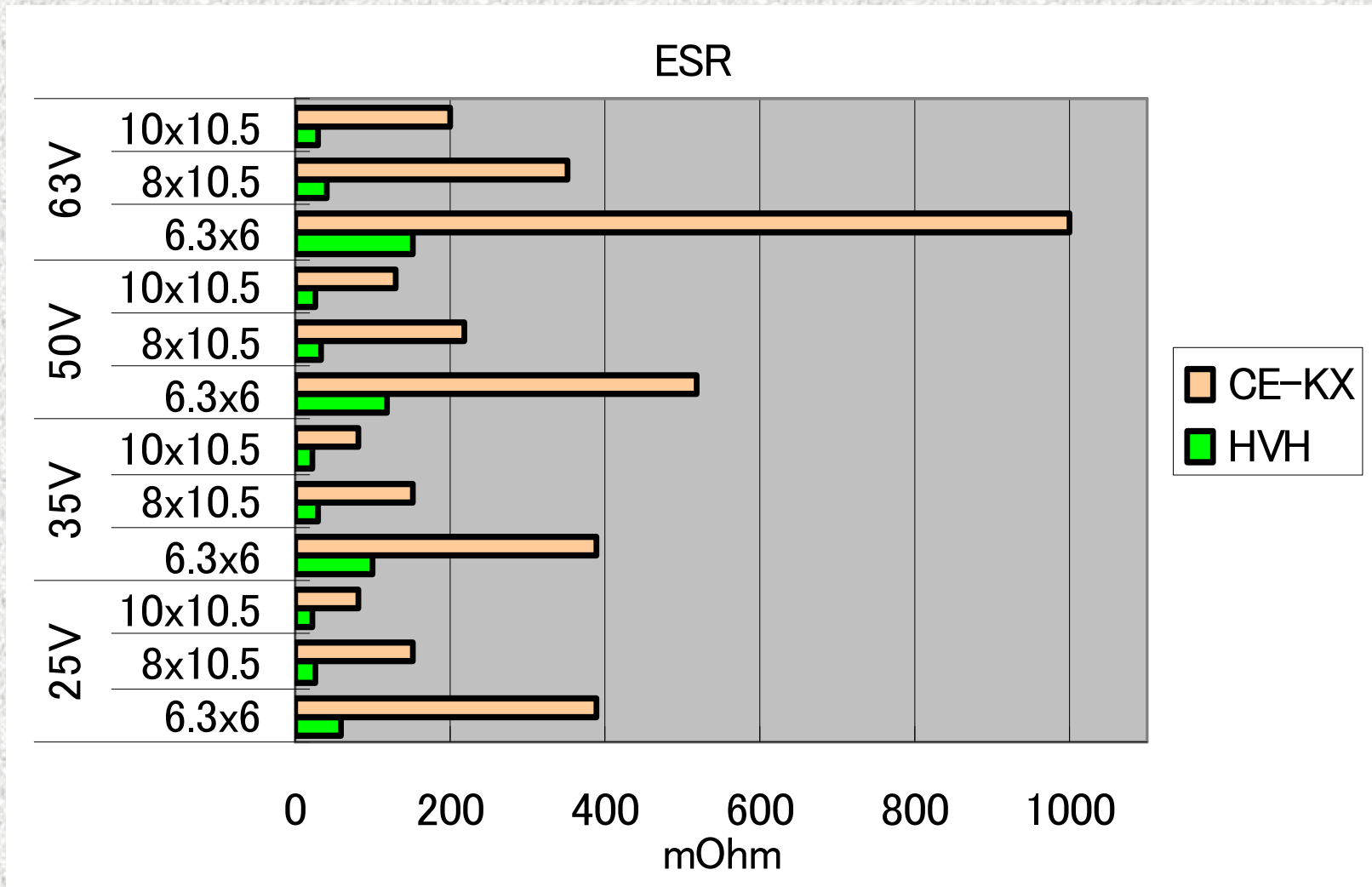
Rated Voltage : 63V

CASE SIZE	HVH series	CE-KX series
D6.3 x 6 	150mOhm 960mA 2.7uF	1000mOhm 90mA 10uF
D8x10.5 	40mOhm 1560mA 22uF	350mOhm 280mA 47uF
D10x10.5 	30mOhm 2100mA 33uF	200mOhm 480mA 100uF

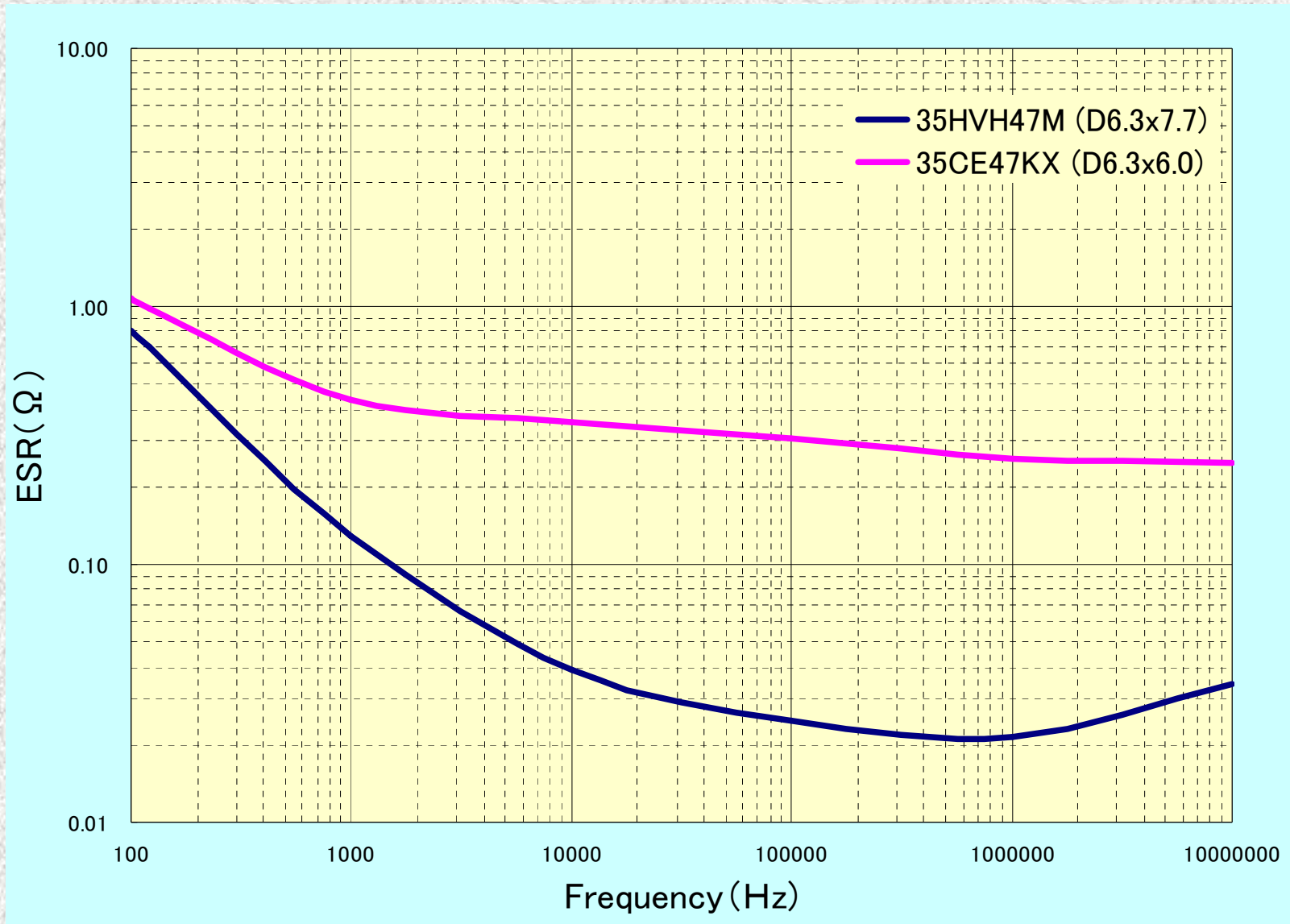
Ripple current comparison to Low ESR E-CAP



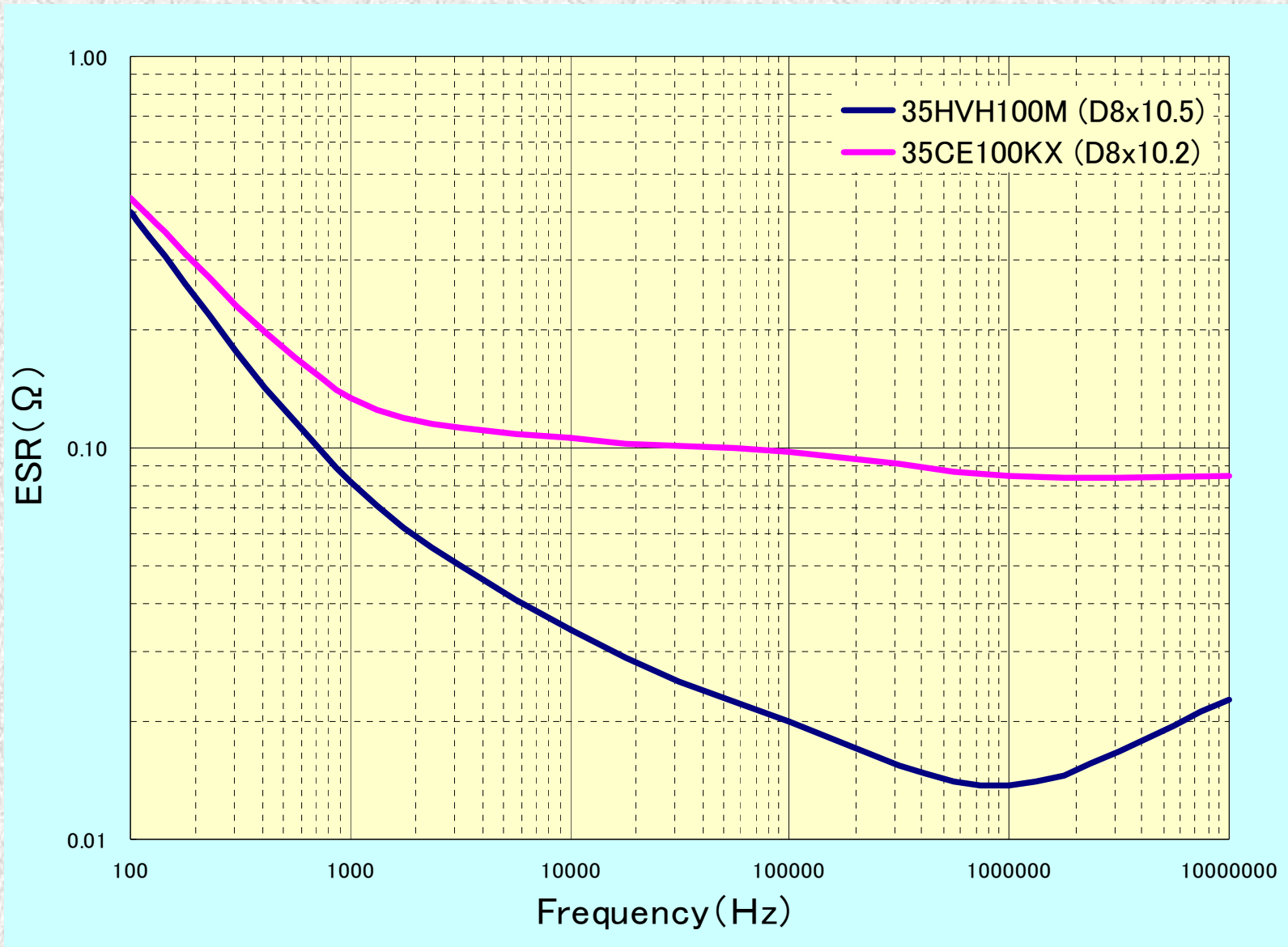
ESR comparison to Low ESR E-CAP



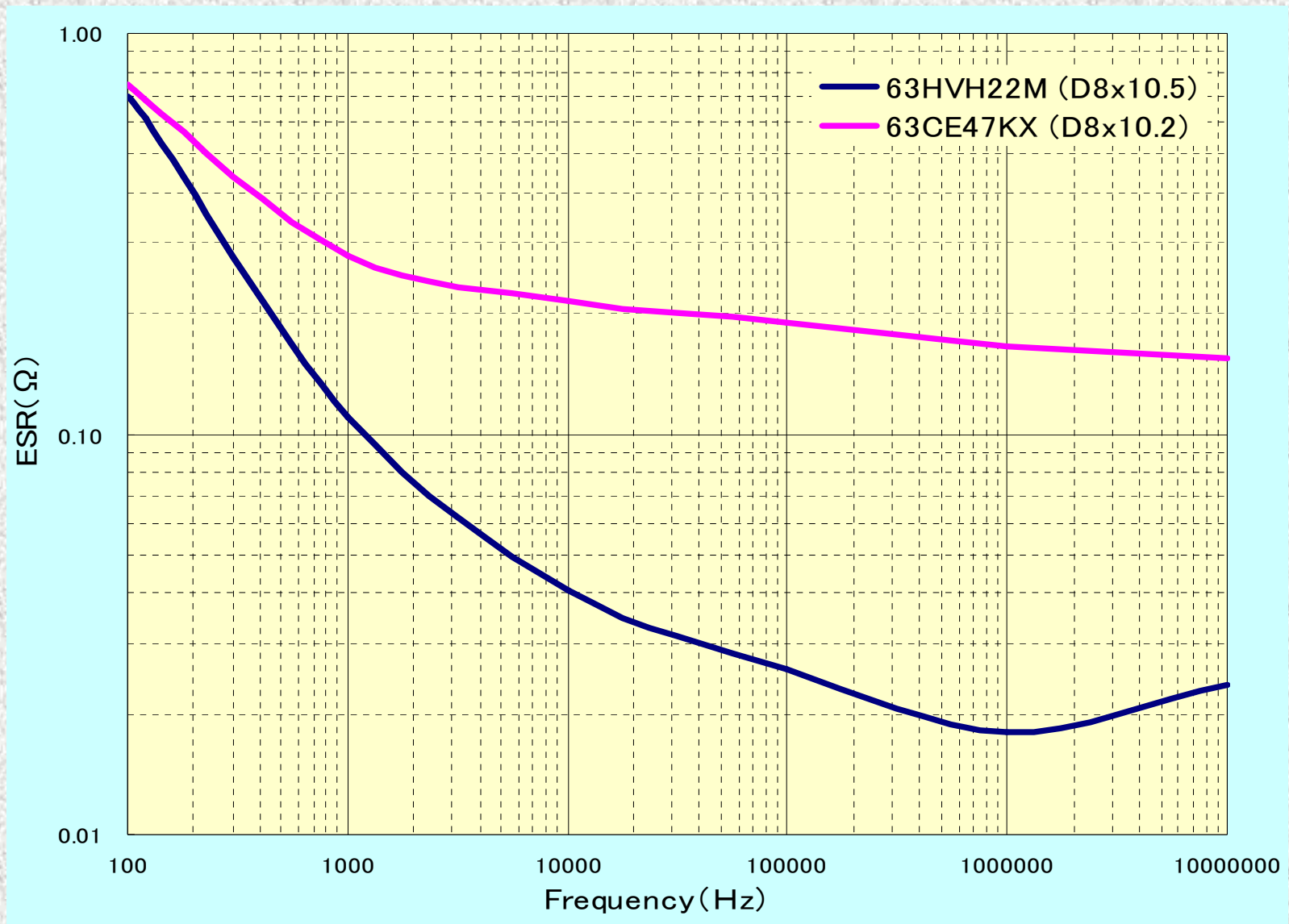
Frequency characteristic (f vs ESR)



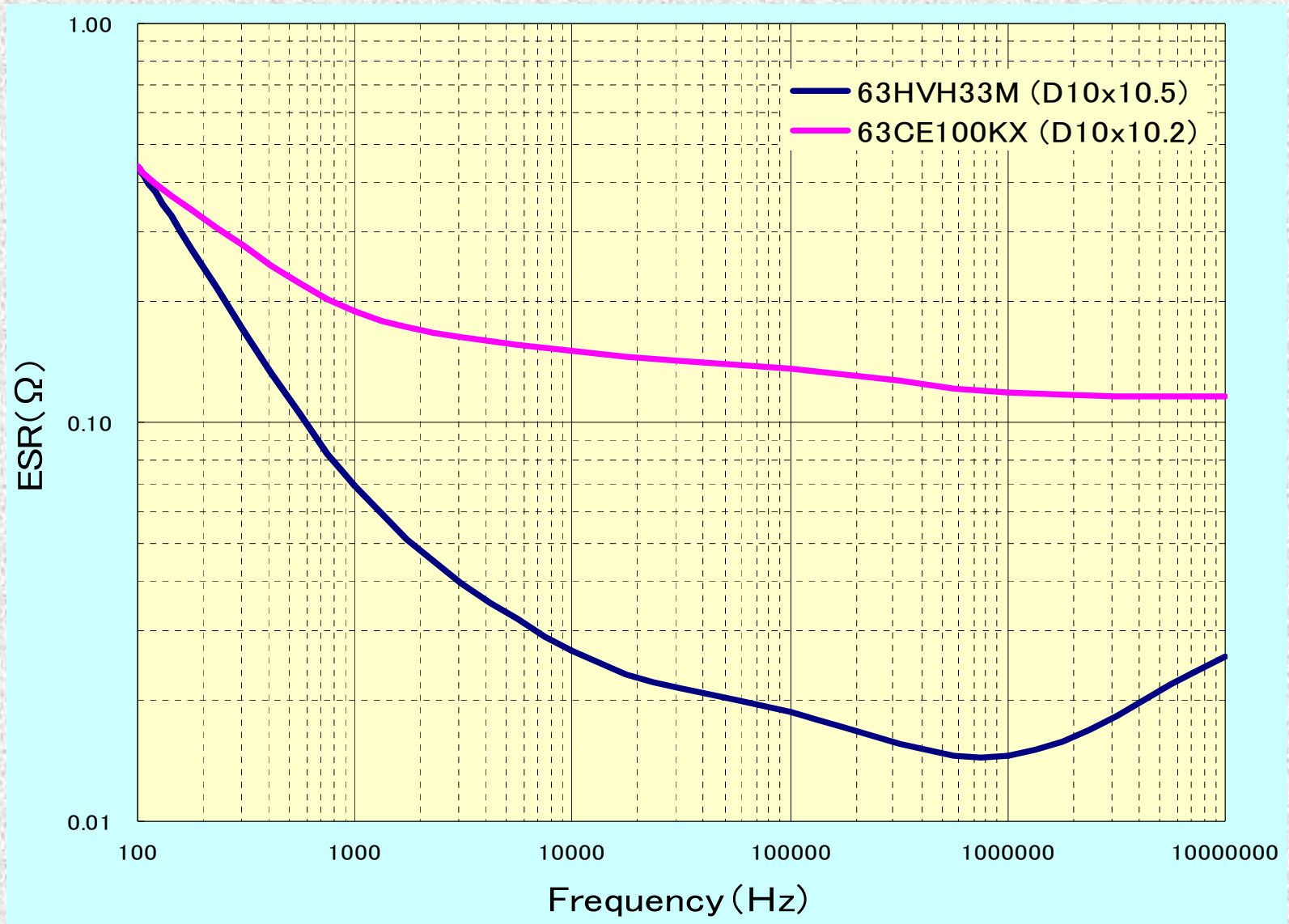
Frequency characteristic (f vs ESR)



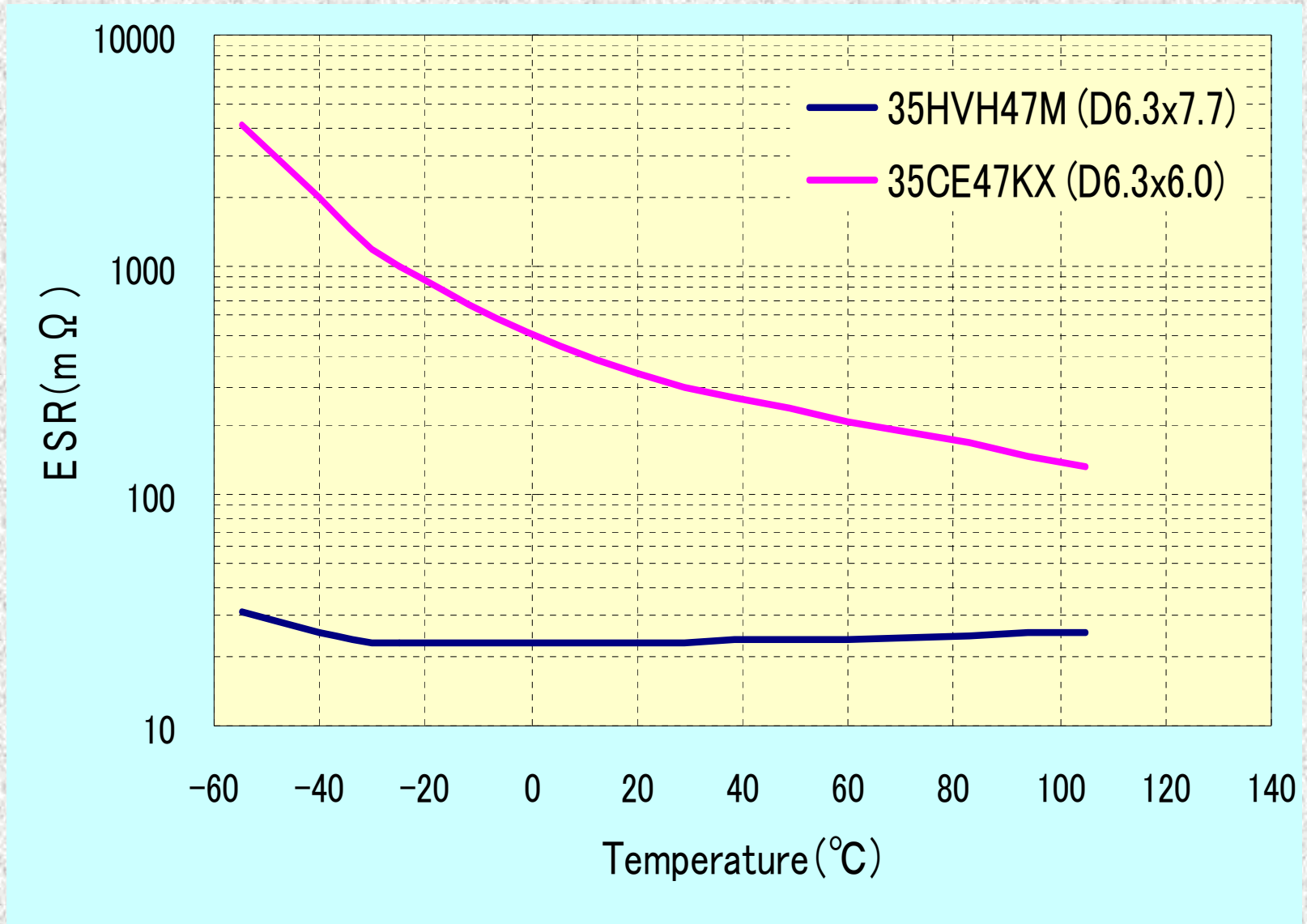
Frequency characteristic (f vs ESR)



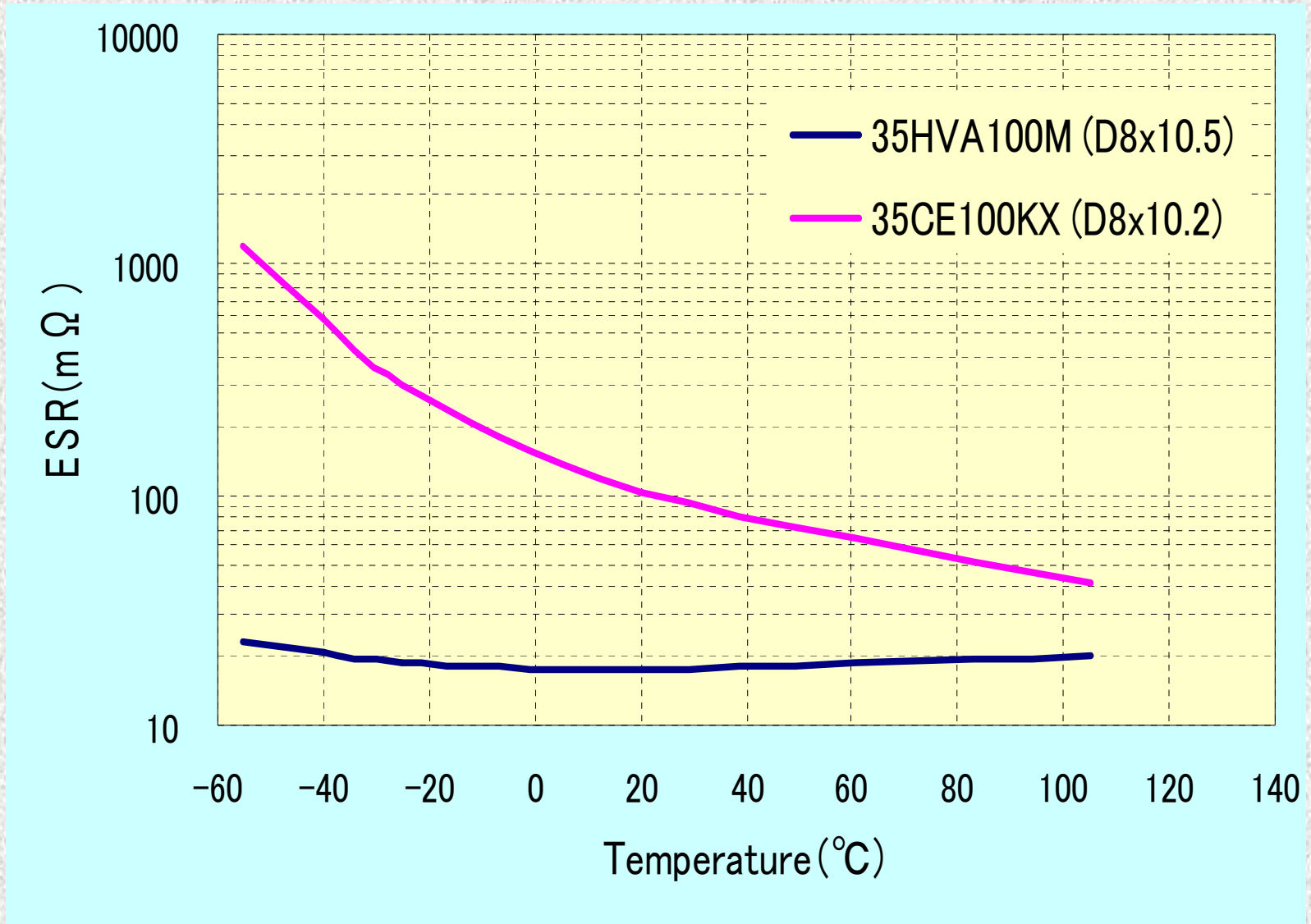
Frequency characteristic (f vs ESR)



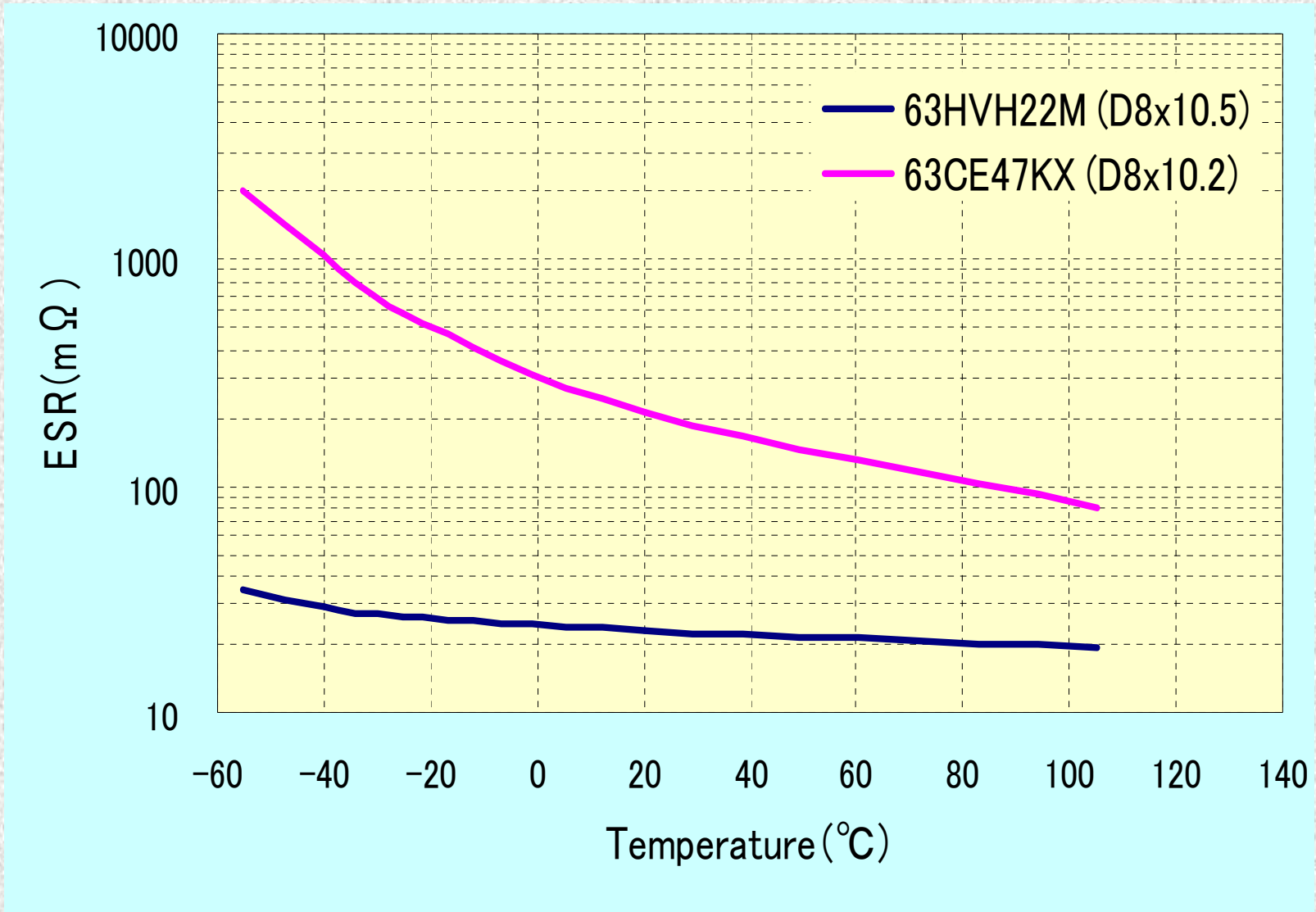
Temperature Characteristics (ESR/100 k Hz)



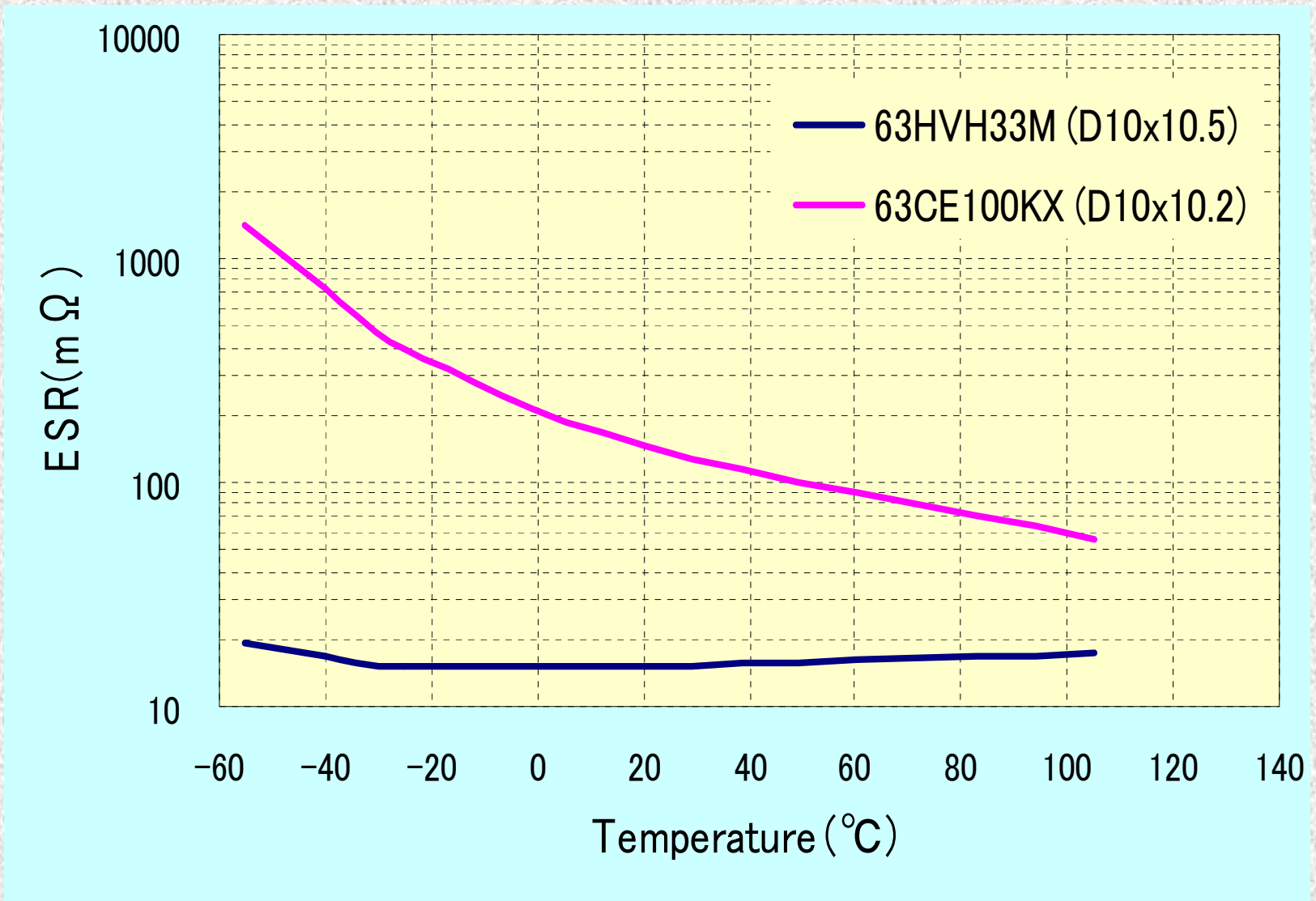
Temperature Characteristics (ESR/100 k Hz)



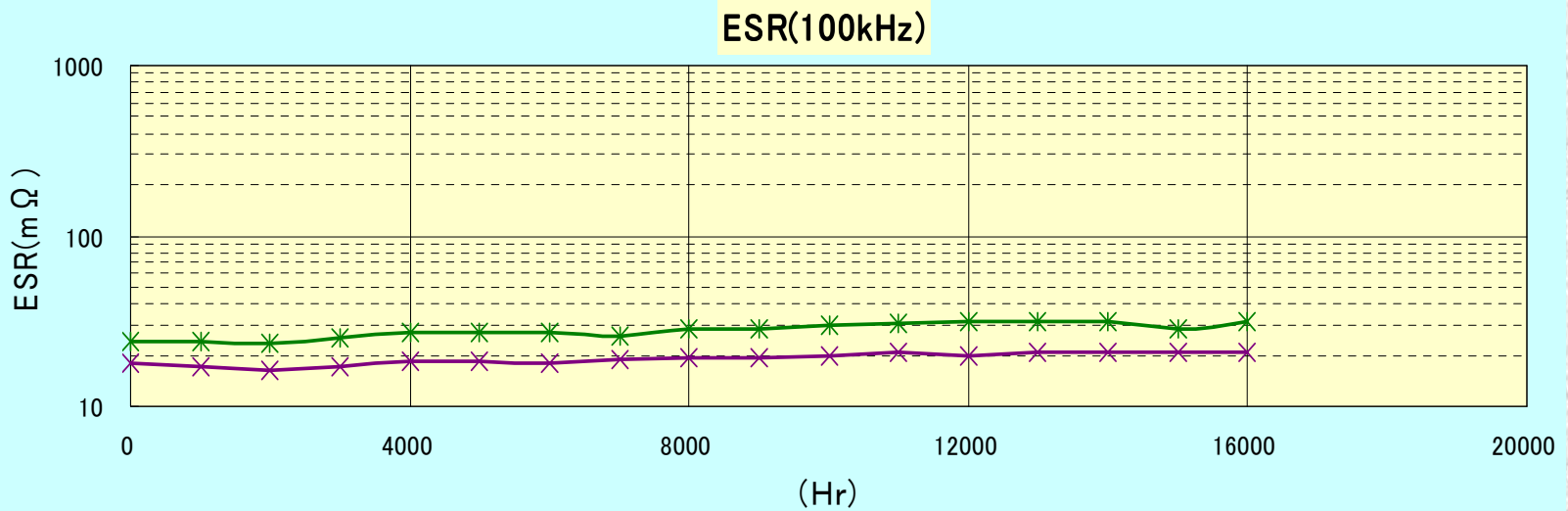
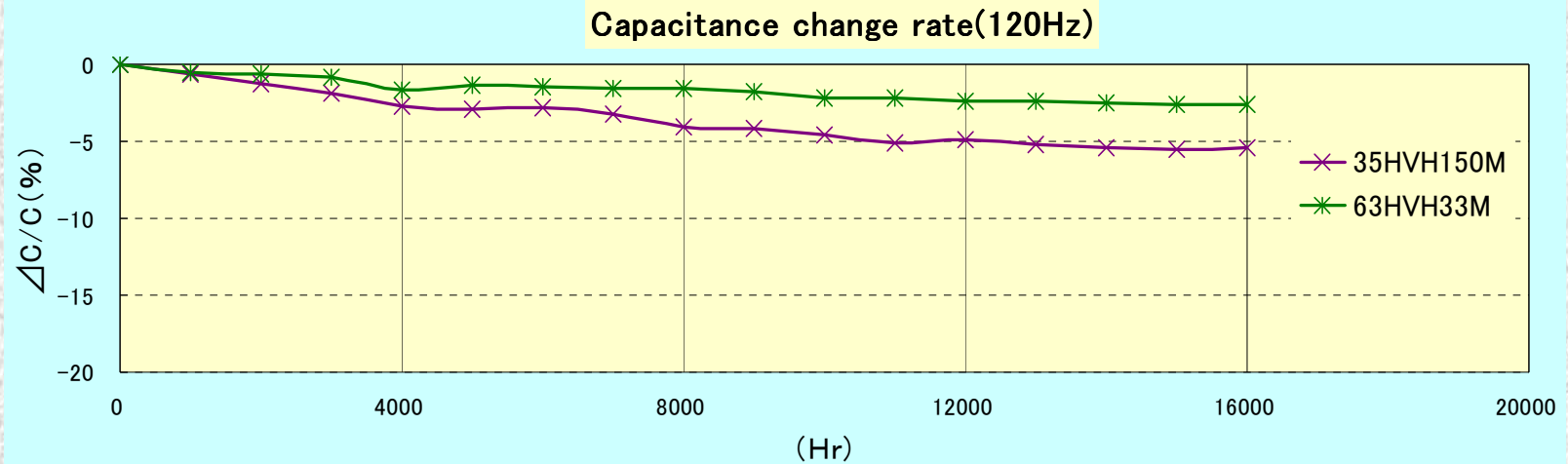
Temperature Characteristics (ESR/100 kHz)



Temperature Characteristics (ESR/100 kHz)

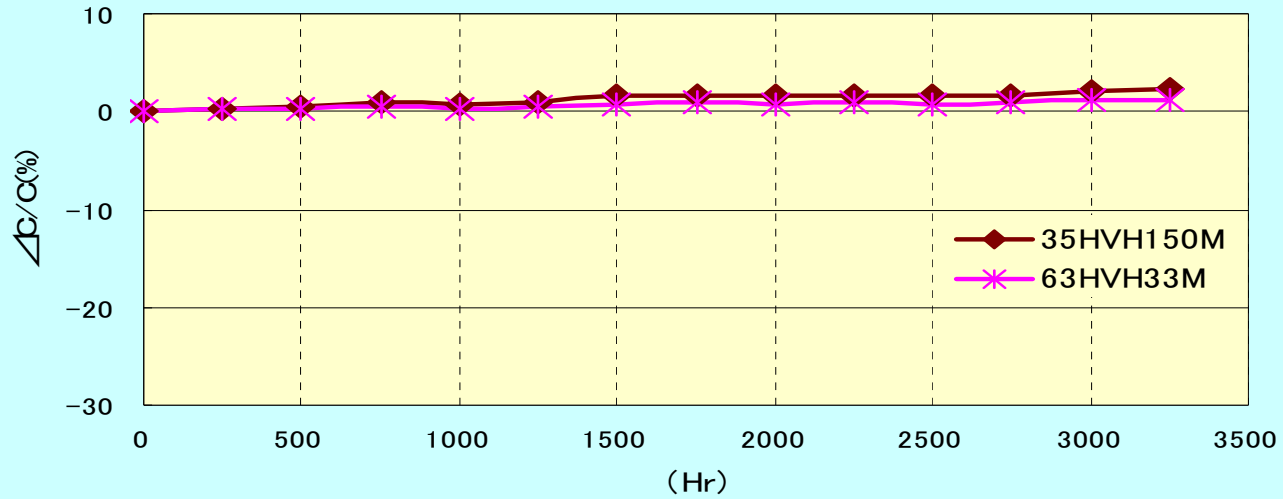


Endurance (105°C rated voltage applied)

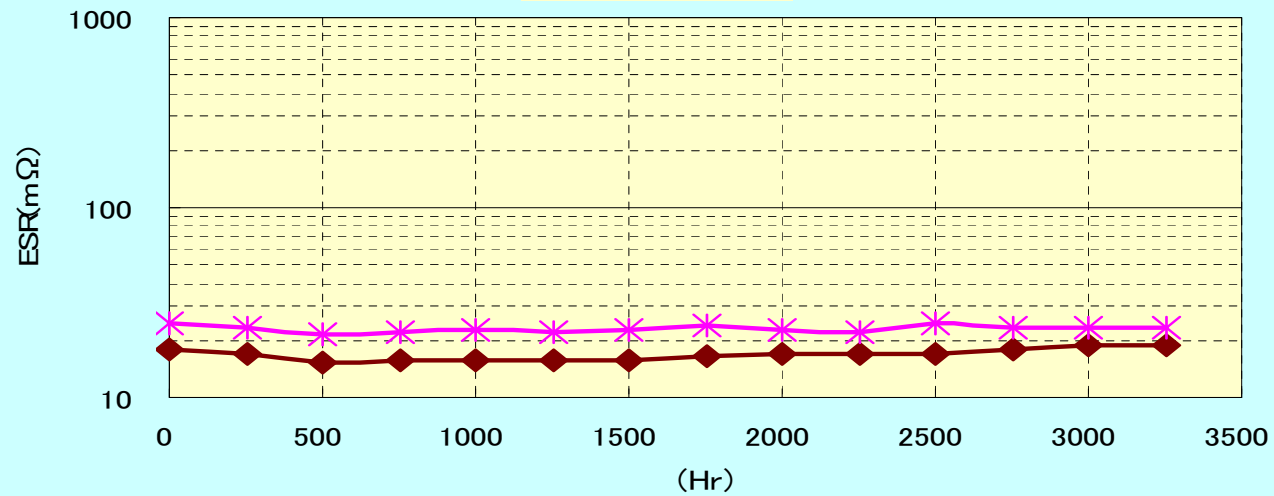


Endurance (85°Cx85%RH)

Capacitance change rate(120Hz)

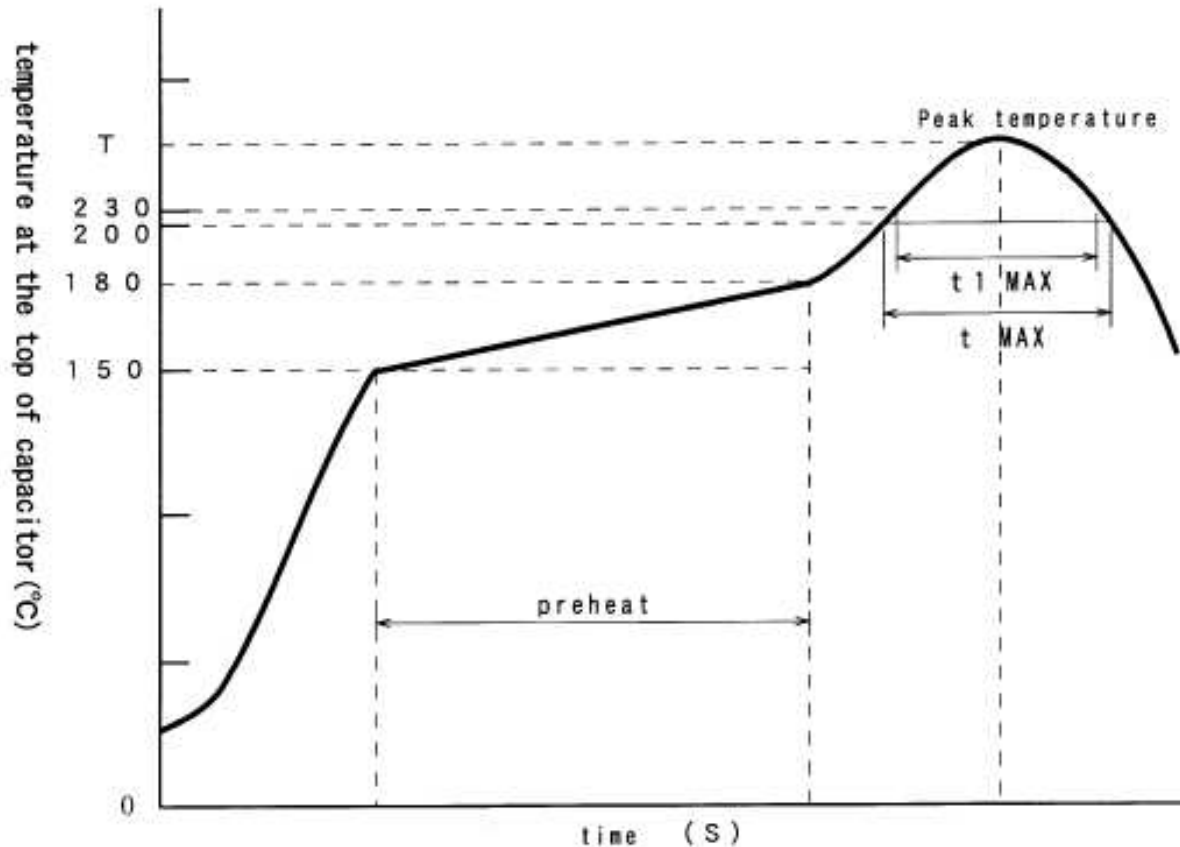


ESR(100kHz)



5. Recommended Reflow Profile

Recommended Reflow Profile



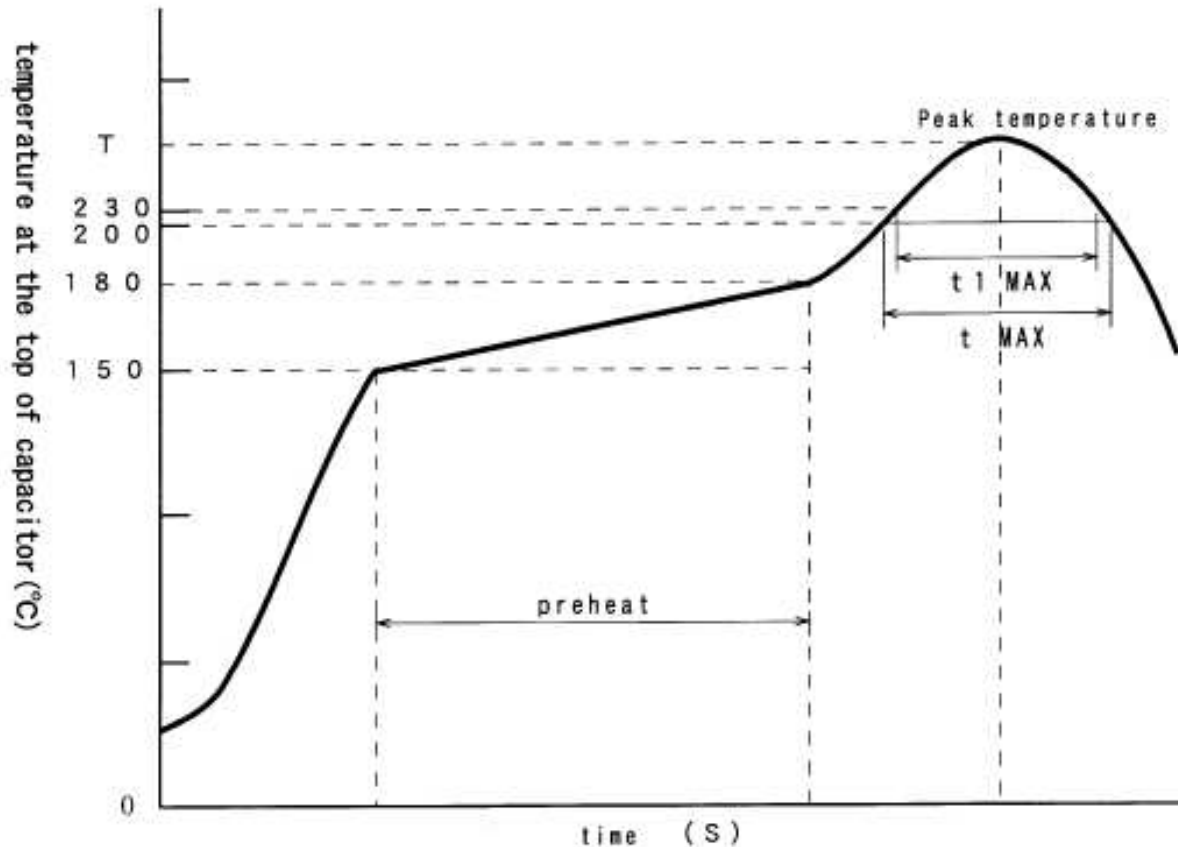
Time for more than 200C(t)	Time for more than 230C(t1)	Peak temperature (T)
Within 80sec.	Within 40sec.	260C, within 5 sec.

※Preheat: 150-180C, within 120 sec.

※Reflow number: Twice or less on the above conditions

The second reflow shall be taken after more than one hour natural cooling time and returning to normal temperature of PCB board and components.

Recommended Reflow Profile



Preheat	200°C	217°C	230°C	245~250°C	Peak	
					2number	1number
150~180°Cx120s	80s	—	40s	—	260°Cx5s	—
150~200°Cx110s	—	90s	—	30s	—	250°C
150~200°Cx110s	—	60s	—	20s	250°C	—

※Preheat: 150-180C, within 120 sec.

※Reflow number: Twice or less on the above conditions

The second reflow shall be taken after more than one hour natural cooling time and returning to normal temperature of PCB board and components.

6. Reliability Presumption of life

Reliability Presumption of life

Twice longer in 10 degrees reduction (The same as E-cap)

$$L = L_0 \times 2^{\frac{T_0 - T_1}{10}} \times 2^{\frac{\Delta T_0 - \Delta T_1}{10}}$$

L ; Life expectancy (hrs)

L_0 ; Guarantee life (hrs) at temperature, T_0 °C

T_0 ; Maximum operating temperature (°C)

T_1 ; Actual operating temperature (°C)

ΔT_0 ; Rise of temperature under Max allowable ripple current

ΔT_1 ; Rise of temperature under actual ripple current

$$L = L_0 \times 2^{\frac{T_0 - T_1}{10}} \times 2^{\left[1 - \left(\frac{I_1}{I_0} \right)^2 \right] \times \frac{\Delta T_0}{10}}$$

I_0 ; Max allowable ripple current (A r.m.s.)

I_1 ; Actual ripple current (A r.m.s.)

HVH series ... $\Delta T_0 = 5^\circ\text{C}$

※ Calculate as $T_1 = 40^\circ\text{C}$, if T_1 is less than 40°C .

Features

- ① Low ESR at high frequency
(Downsize and upgrade your circuit !)
- ② Excellent temperature characteristics
(Stable performance at wide temperature range !)
- ③ Compared to solid capacitors, short circuit mode seldom happen and L.C. is lower.
- ④ Rated voltage is up to 63V and 85°C x 85%RH is guaranteed.
- ⑤ Voltage derating is not needed.
- ⑥ ROHS compliance and lead-free

New Hybrid Series

HS-CONTM

Aluminum Electrolytic Capacitor
with **H**ybrid **S**emiconductor

HVH Series

New Technology!





Thank you!

Jul.2007
Electronic Device Company
Marketing Center