



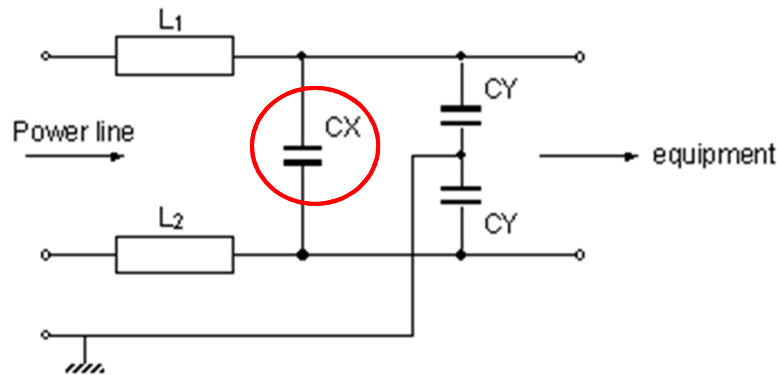
Electronic Components
KEMET
CHARGED.[®]

DC Film F862 Series
EMI Film Suppression Products

December 2014

Cx – X2 Film Cap functions

X2 in parallel to the mains



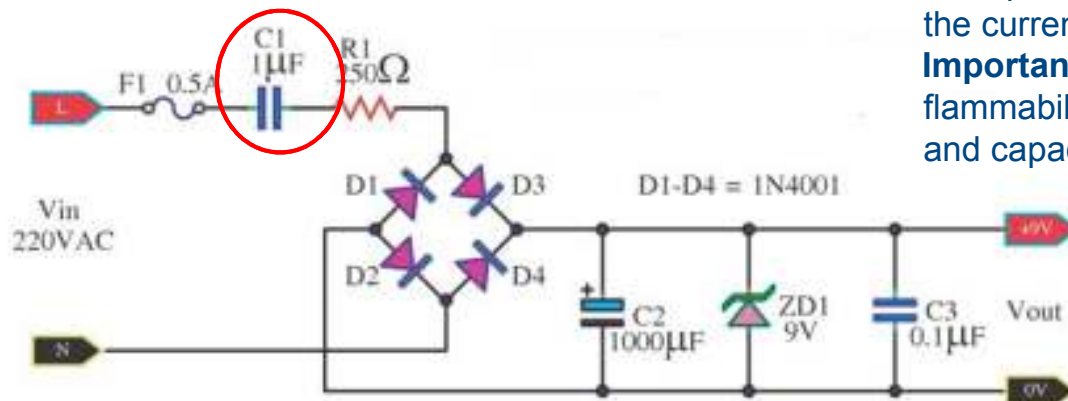
- Every electronic / electrical equipment produce **Radio Frequency Interferences (RFI)** and generate (**Electro Magnetic Interference - EMI**).

What do X and Y capacitors do ?

X and Y capacitors suppress EMI to ensure electromagnetic compatibility EMC and avoid malfunctions.

Important features: self-healing, active/passive flammability, EN, UL, CQC recognized , dissipation factor and capacitance stability,.

X2 in series to the mains



- Few watts Power Supplies are designed with a voltage divider to drop rated mains voltage

What do X capacitors does ?

X drop the voltage from the Mains to few Volts and supply the current to the load

Important features: self-healing, active/passive flammability, EN, UL, CQC recognized , dissipation factor and capacitance stability,.

Harsh environmental conditions and multifunctions definition



- **Harsh environmental conditions**

High Relative Humidity (R.H.) combined with temperature can deteriorate the internal film metallization and then cause

- **Capacitance drop**

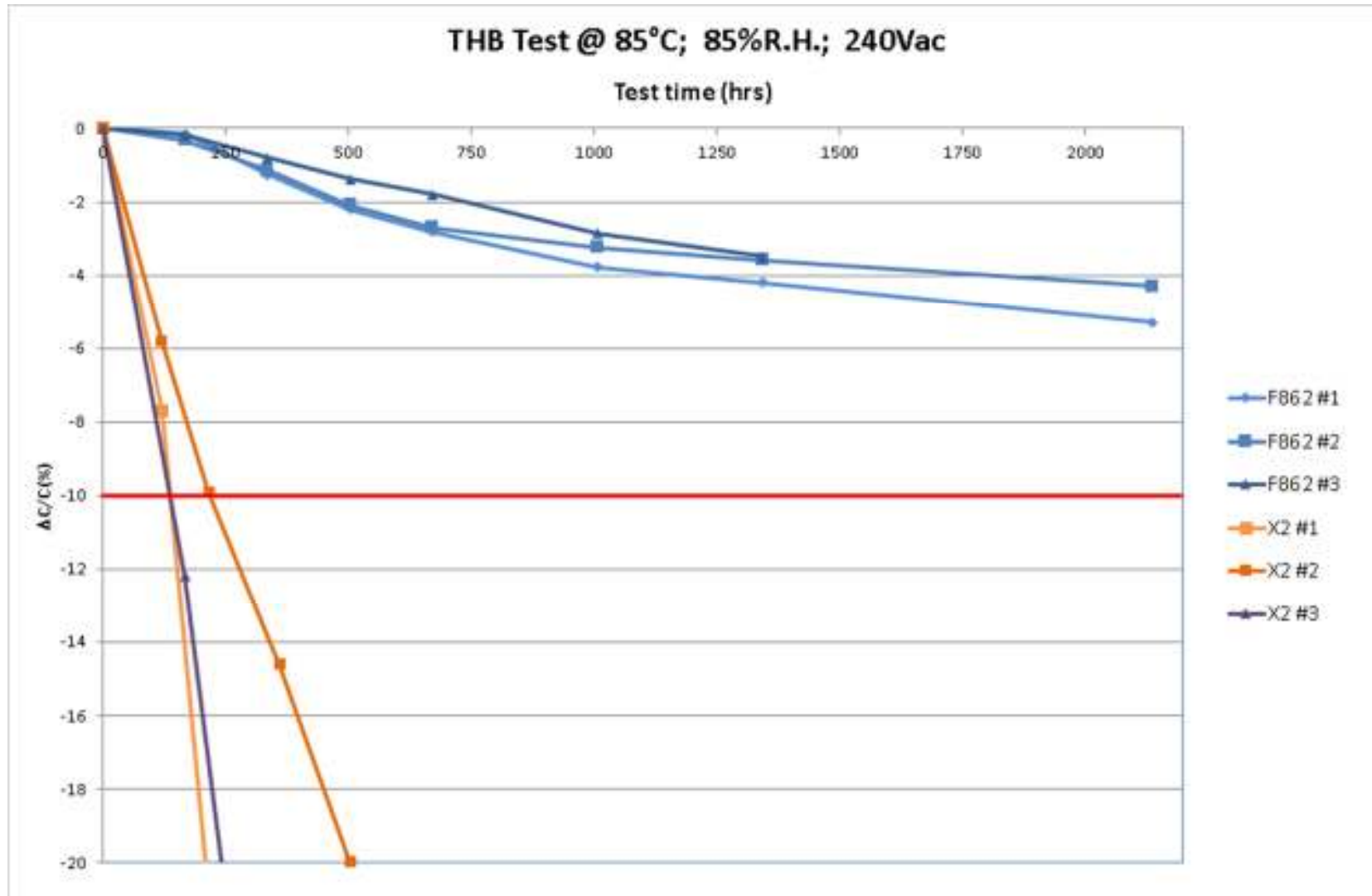
→ the device will stop working
(Application in series)

→ the device will emit EMI and damage
other devices (Application in parallel)

- **Dissipation Factor increase** → the capacitor will be overheating and
damaging the device

Mulfunction: how to fix it

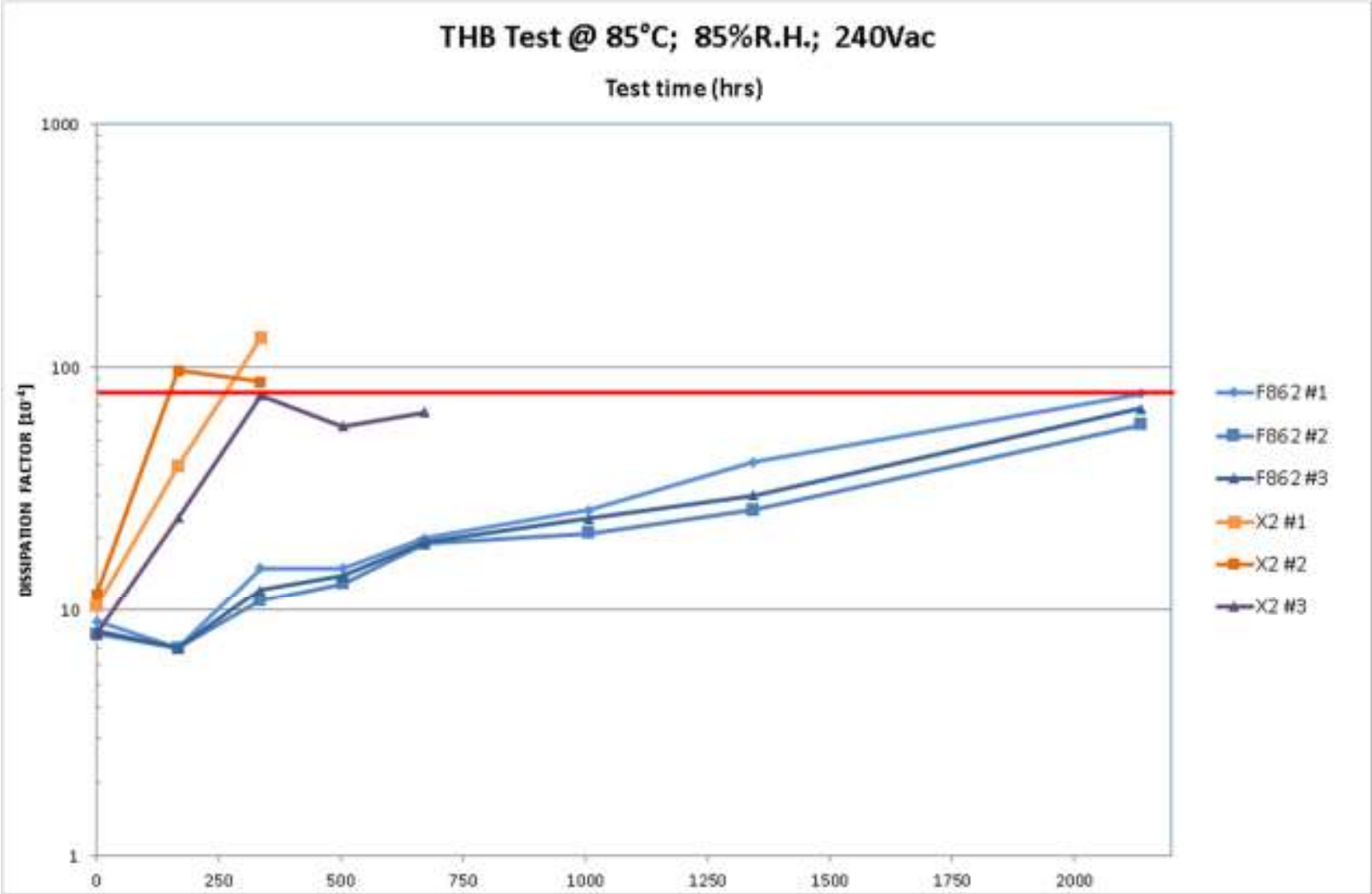
Capacitance Drop → F862 fix it



Mulfunction: how to fix it



Dissipation factor increase → F862 fix it



F862 X2 for Harsh Environmental Conditions



AC Line EMI Suppression and RC Networks

F862 Series Metallized Polypropylene Film for Harsh Environmental Conditions, Class X2, 310 VAC (Automotive Grade)



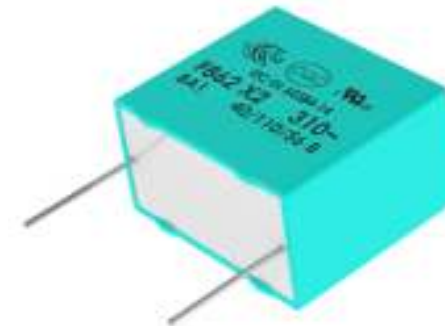
GENERAL TECHNICAL DATA

Dielectric: Polypropylene film
 Plates: Metal layer deposited by evaporation under vacuum
 Winding: Non-inductive type
 Leads: Copper tinned wire
 Protection: Plastic case green color, thermosetting resin filled.
 Box material is solvent resistant and flame retardant according to UL94-V0

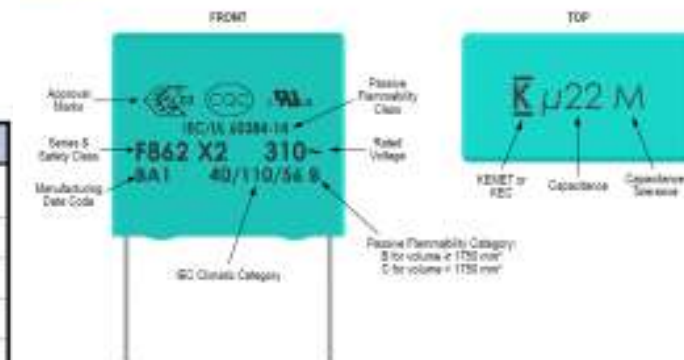
Climate Category: 40/100/56 (IEC 60068-1)
 Operating temperature range: -40 to +110°C

ELECTRICAL CHARACTERISTICS

Rated Voltage (V_R): 310 Vac (50/60Hz)
 Capacitance tolerance: $\pm 20\%$ (M), $\pm 10\%$ (K) (measured @ 1kHz / 25°C $\pm 5^\circ\text{C}$)
 Dissipation Factor ($\text{tg}\delta$): $\leq 20 \cdot 10^{-4}$ (measured @ 1kHz / 25°C $\pm 5^\circ\text{C}$)
 Insulation Resistance: $\geq 1 \cdot 10^5 \text{ M}\Omega$ (measured @ 100Vdc/25°C for 1 min.)
 Test voltage between terminals: 1900Vdc for 1s @ 25°C $\pm 5^\circ\text{C}$

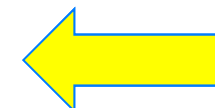


Marking



Environmental Test Data

Test	IEC Publication	Procedure
Endurance	IEC 60384-14	1.25 x V_R VAC 50 Hz, once every hour increase to 1,000 VAC for 0.1 second, 1,000 hours at upper rated temperature
Vibration	IEC 60068-2-6 Test Fc	3 directions at 2 hours each 10 - 55 Hz at 0.75 mm or 98 m/s ²
Bump	IEC 60068-2-29 Test Eb	1,000 bumps at 390 m/s ²
Change of Temperature	IEC 60068-2-14 Test Na	Upper and lower rated temperature 5 cycles
Active Flammability	IEC 60384-14	$V_R + 20$ surge pulses at 2.5 kV (pulse every 5 seconds)
Passive Flammability	IEC 60384-14	IEC 60384-1, IEC 60695-11-5 Needle-flame test
Damp Heat Steady State	IEC 60068-2-78 Test Cab	+40°C and 93% RH, 56 days
THB Test		85°C, 85% RH and 240 VAC, 1,000 hours Capacitance change ($\Delta C/C$): $\leq 10\%$ Dissipation factor change ($\Delta \text{tan } \delta$): $\leq 5 \cdot 10^{-3}$ (at 1 kHz) Insulation resistance R_{ins} or time constant $\tau = CR$ $R_{ins} \geq 50\%$ of initial limit



Key test

F862

Ratings & Part Number Reference



Table 1 – Ratings & Part Number Reference

Capacitance Value (µF)	Size Code	Maximum Dimensions in mm			Lead Spacing (p)	dV/dt (V/µs)	Part Number
		B	H	L			
0.1	BK	7.5	13.5	18	15	400	F862BK104(1)310(2)
0.12	BK	7.5	13.5	18	15	400	F862BK124(1)310(2)
0.15	BK	7.5	13.5	18	15	400	F862BK154(1)310(2)
0.18	BP	8.5	14.5	18	15	400	F862BP184(1)310(2)
0.22	BP	8.5	14.5	18	15	400	F862BP224(1)310(2)
0.33	BS	10	16	18	15	400	F862BS334(1)310(2)
0.39	BS	10	16	18	15	400	F862BS394(1)310(2)
0.47	BY	11	19	18	15	400	F862BY474(1)310(2)
0.56	BZ	12	20	18	15	400	F862BZ564(1)310(2)
0.47	DO	10	18.5	26	22.5	200	F862DO474(1)310(2)
0.56	DO	10	18.5	26	22.5	200	F862DO564(1)310(2)
0.68	DP	11	20	26	22.5	200	F862DP684(1)310(2)
0.82	DP	11	20	26	22.5	200	F862DP824(1)310(2)
1	DU	13	22	26	22.5	200	F862DU105(1)310(2)
1.2	DU	13	22	26	22.5	200	F862DU125(1)310(2)
1	FC	11	20	31.5	27.5	150	F862FC105(1)310(2)
1.5	FI	13	25	31.5	27.5	150	F862FI155(1)310(2)
2.2	FN	14	28	31.5	27.5	150	F862FN225(1)310(2)
3.3	FS	19	29	31.5	27.5	150	F862FS335(1)310(2)
4.7	FY	22	37	31.5	27.5	150	F862FY475(1)310(2)
Capacitance Value (µF)	Size Code	B (mm)	H (mm)	L (mm)	Lead Spacing (p)	dV/dt (V/µs)	Part Number

(1) M = ±20%, K = ±10%.

(2) Insert lead and packaging code. See Ordering Options Table for available options.

Blue text = In progress, samples available.

F862 - Capacitive Power Supply in Series to the mains function

Main applications



Energy Meters



White Goods (auxiliary loads)

F862 - Industrial across the line function



Main applications



Variable Frequency



Photovoltaic converters



Motor drives



Special Pumps Drives



Submarine Pumps



Automotive on board battery chargers

General statement related to this product introduction



For design in confirmation customer shall contact KEMET technical dept as this is a guideline only and we accept no responsibility whatsoever.



Thank You!