Application notes for Network camera (IP camera)

Market changes	Performance	The role of capacitors
smaller size, higher resolution image, Introduction of image analysis/AI technology	lower profile/ smaller size, higher current	low ripple noise, voltage fluctuation stability

1． What Is a Polymer Aluminum Electrolytic Capacitor?

Murata's polymer capacitors are solid-state layered film polymer aluminum capacitors (ECAS series).They have low noise, low ripple noise and high reliability. Additionally, there is no DC bias characteristic for capacitance and the temperature characteristic is stable.

This contributes to reducing the number of parts as well as the size of the circuit board area.

2． What is required of Network camera (IP camera)?

The switch is underway from analog cameras whose main purpose is shooting, such as security cameras, to network cameras that can connect to the Internet and analyze the data that has been shot.

Network cameras can send high-quality video data and can also be integrated with AI. Consequently, there are expectations for even higher quality images and further advances in image analysis technologies utilizing AI. stricter power supply noise suppression and designs with stabilized voltage fluctuations have become important as the size of the current in power supply circuits becomes larger.

3． Network camera (IP camera) issues

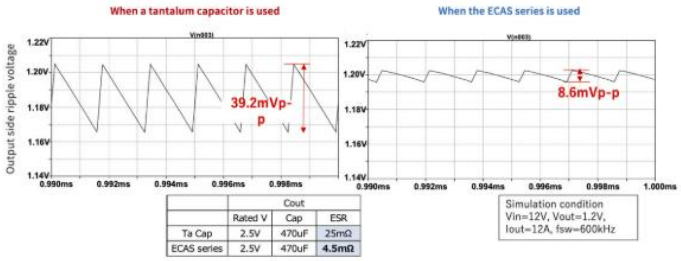
・Stricter power supply noise suppression as the size of the current becomes larger

・Designs with stabilized voltage fluctuations

4． Benefits of using Murata's ECAS series products

①Low ripple noise

The ECAS series with its low ESR characteristics has excellent ripple noise suppression performance.



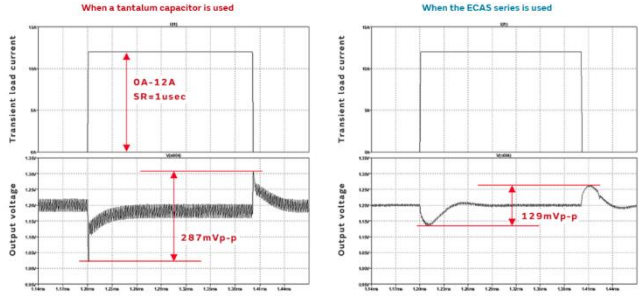
	Cout		
	Rated V	Cap	ESR
Ta Cap	2.5V	470uF	25mΩ
ECAS series	2.5V	470uF	4.5mΩ

Simulation condition
Vin=12V, Vout=1.2V,
Iout=12A, fsw=600kHz

[Results of a simulation]

②Voltage fluctuation stability with respect to load fluctuations

The ECAS series with its large capacitance characteristics features excellent stability with respect to load-side fluctuations in large-current applications.



5． Comparison with other capacitors

〔Ta capacitors〕

・Reliability：

The ECAS has more stable reliability compared to tantalum capacitors, which contributes to stable set operation.

〔MLCC〕

・Reduction in quantity due to large capacitance：

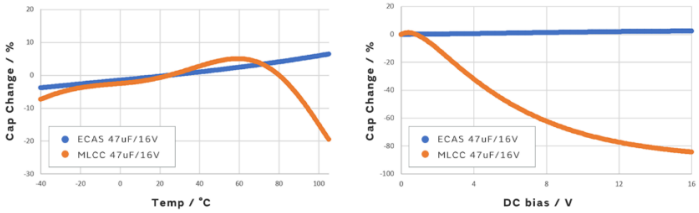
The ECAS series has larger capacitance and no voltage dependence compared to MLCC, so the number of components can be reduced to achieve a smaller set in applications currently using large numbers of MLCC.

Item	Total effective capacitance @ 1.8V	Qty.	Total area
ECAS 470μF/2.5V	470	1	31.4
MLCC 100μF/6.3V	491	6	40

・Stable capacitance with respect to temperature and voltage changes：

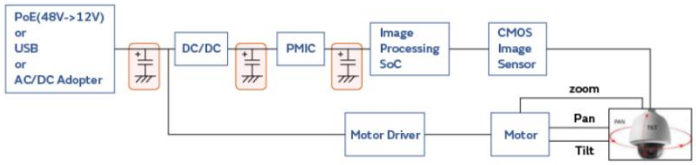
The effective capacitance of MLCC varies with changes in DC voltage and temperature.

By contrast, the ECAS series has almost no capacitance change with respect to DC voltage or temperature, enabling use for stable power supply design.



6． Example of applied circui

They can be applied on circuits in the diagram below.



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