

X-Capacitor Discharge ICs Enable Faster Discharge

[Power Integrations'](#) two-terminal CAPZero-3 ICs enable designers to easily meet IEC60335 safety approvals for major appliances, and cover all capacitor values from 100 nF to 6 μ F. When compared with previous-generation CAPZero chips, the CAPZero-3 devices allow faster discharge of X-capacitor energy. The new devices guarantee operation for discharge resistor values of up to 54 k Ω versus 150 k Ω in earlier CAPZero generations, which include CAPZero and CAPZero-2. The CAPZero-3 ICs are pin compatible with their predecessors.

IEC60335 is the discharge safety standard for all appliances. To protect the user from an electrical hazard, it requires the voltage across the input X capacitor to discharge to less than 34 V within less than 1 sec after the ac is removed. CAPZero-3 ICs block current flow through the X-capacitor discharge resistors when the ac voltage is connected, and automatically discharge X-capacitors through those resistors when the ac is disconnected (see the figure). CAPZero-3 ICs simplify EMI filter designs while permitting the use of larger X capacitors, which in turn enables smaller inductive components to be used with no resulting change in power consumption.

CAPZero-3 ICs can be placed before or after a system's input fuse. Devices deliver high common-mode surge immunity so that no external ground connection is necessary, and feature a high differential surge withstand due to 1000-V internal MOSFETs. Creepage on the package and PCB is maintained at >4 mm.

Comments Edward Ong, product manager, Power Integrations: "With the launch of the new CAPZero-3 ICs, designers can use one part to address a large range of applications in small and major appliances that require X capacitor values from 100 nF to 6 μ F."

CAPZero-3 devices are safety-certified to CB and Nemko requirements and so developers do not need to perform a separate safety test on the X-capacitor discharge circuit of the power supply. Devices are available now, priced at \$0.31 in 1,000-piece quantities. Technical support is available from the [Power Integrations website](#).

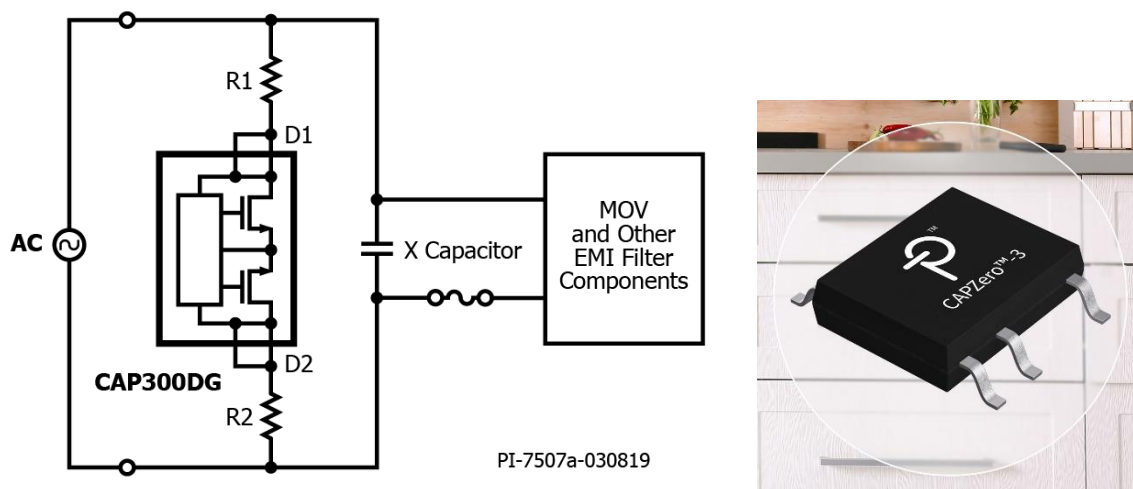


Figure. CAPZero-3 ICs block current flow through the X-capacitor discharge resistors (R1 and R2) when the ac voltage is connected, and automatically discharge X capacitors through those resistors when the ac is disconnected.