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## Film Capacitors: **Protection in a dual pack**

With the CombiSuppressor in the B32529-V (RM 5) and B32521-V (RM 10) series EPCOS has developed an innovative solution for EMI suppression in DC motors in motor vehicles. The CombiSuppressor comprises a film capacitor and a multilayer ceramic varistor connected in parallel in a plastic case. This packaging technology offers mechanical protection for the components and facilitates automatic picking and placement. The items are designed for operating temperatures from -55 °C to 125 °C. The capacitors are characterized by high pulse load capability of up to 250 V/ $\mu$ s and meet ISO 7631. These components are available for operating voltages ranging from 22 to 45 VDC and threshold voltages of the varistor from 44 to 90 V. Their capacitances cover a range from 0.47 to 2.2  $\mu$ F. All types have a leakage current of less than 50  $\mu$ A.

Many top-range vehicles now employ more than 100 electric motors, all of which must operate interference-free in a sensitive environment. In order to eliminate electromagnetic interference directly at the motor — and thus to assure interference-free operation of all other electronic units in the automobile — significantly more EMI suppression components must now be built into the same space compared with the requirements of just a few years ago. The CombiSuppressor from EPCOS has the functionality of two components in a single package and thus offers users significant benefits in space required, placement costs and logistics expenditures. Typical applications for the CombiSuppressor include windshield wipers, electrical seat adjusters, electrical windows, electrical sun-roofs, gasoline and oil pumps as well as central locking systems.

The CombiSuppressor is a leaded component supplied in bulk with varied leads, packaged on reels or in an Ammopack. To weld the components directly onto a carrier frame when no separate circuit board is used, the leads can also be supplied bent, as specified by the customer.



Electronic Parts and Components

Press Release for the Trade Press

As an alternative to the film capacitors, EPCOS has also extended its range of super high-capacitance varistors (SHCVs) and is now the first manufacturer to offer the SHCV SR6 series in case size 1206. SHCVs are leaded components combining a multilayer varistor with a multilayer ceramic capacitor for overvoltage protection and radio interference suppression. Like the CombiSuppressor, the SR6 series was also specially developed for interference suppression in DC motors. EPCOS thus satisfies requirements for improved technical properties such as constant capacitance with X7R ceramic, an extended temperature range from -55 to +125 °C, significant miniaturization of standard EMC components, and cost reduction. SHCV SR6 types are currently available with ratings of 220 nF/14 V and 470 nF/35 V as well as 1 µF/20 V and 1 µF/35 V.

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