

## Multilayer ceramic capacitors

### World's first flip-type MLCCs in 0510 design for automotive applications

- Particularly suitable for noise suppression and decoupling
- Permitting space-saving designs and a reduction in the number of components
- Qualified in accordance with AEC-Q200

January 28, 2020

TDK Corporation (TSE: 6762) has developed the new CGAE series, the world's first flip-type MLCCs in 0510 design (EIA 0204) with capacitances of up to 1  $\mu\text{F}$ , for automotive applications\*. Depending on their capacitance, the capacitors are designed for rated voltages of between 4 V and 50 V and they cover a capacitance range from 47 nF to 1  $\mu\text{F}$ . All types of the new series are qualified in accordance with AEC-Q200. Volume production began in January 2020.

In contrast to conventional MLCCs, the connections on the flip-type capacitors are rotated through 90°. This produces a wider and, at the same time, shorter current path, which results in lower ESL and ESR values, and thus lower impedances. Flip-type MLCCs have already proven themselves in numerous applications.

Advanced driver-assistance systems (ADAS) are becoming increasingly important for improving safety. At the same time, a growing number of functionalities that support autonomous driving, are being established. These require computing power comparable to that of PCs or smartphones. The ICs used for this purpose are therefore offering ever more functions, which means that a growing number of decoupling MLCCs are required for noise suppression. At the same time, the trend toward space-saving designs is continuing, boosting the demand for high-efficiency components for noise suppression.

Thanks to the high efficiency of the new capacitors in noise suppression and decoupling, the number of MLCCs required can be reduced. TDK will, in future, develop even greater capacitance values, so that it can extend the product range and serve the growing number of automotive applications.

\*Status: January 2020 according to studies by TDK

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#### Main applications

Noise suppression and decoupling of supply lines for automotive electronic control units (ECUs)

#### Main features and benefits

- High capacitance of 1  $\mu\text{F}$  in the 0510 design (EIA 0204)
- Low ESL values, thus requiring fewer MLCCs
- High reliability thanks to qualification in accordance with AEC-Q200

## Key data

Type	Dimensions [mm]	Temperature characteristics	Rated voltage [V]	Capacitance
CGAEA1X7R1H473M	0.52 x 1.00 x 0.30	X7R	50	47 nF
CGAEA2X7R1E473M	0.52 x 1.00 x 0.30	X7R	25	47 nF
CGAEA1X7T0J104M	0.52 x 1.00 x 0.30	X7T	6.3	100 nF
CGAEA3X7T0G104M	0.52 x 1.00 x 0.30	X7T	4	100 nF
CGAEB1X7T0G105M	0.58 x 1.10 x 0.58	X7T	4	1 μF

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## About TDK Corporation

TDK Corporation is a leading electronics company based in Tokyo, Japan. It was established in 1935 to commercialize ferrite, a key material in electronic and magnetic products. TDK's comprehensive portfolio features passive components such as ceramic, aluminum electrolytic and film capacitors, as well as magnetics, high-frequency, and piezo and protection devices. The product spectrum also includes sensors and sensor systems such as temperature and pressure, magnetic, and MEMS sensors. In addition, TDK provides power supplies and energy devices, magnetic heads and more. These products are marketed under the product brands TDK, EPCOS, InvenSense, Micronas, Tronics and TDK-Lambda. TDK focuses on demanding markets in the areas of information and communication technology and automotive, industrial and consumer electronics. The company has a network of design and manufacturing locations and sales offices in Asia, Europe, and in North and South America. In fiscal 2019, TDK posted total sales of USD 12.5 billion and employed about 105,000 people worldwide.

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