



FAQ for MDSA / MDSK Leaded Multilayer Ceramic Capacitors

Q: Why are MDSA / MDSK suitable for automotive electronic systems?

A: Because MDSA / MDSK are AEC-Q200 qualified, with an operating temperature range of -55 °C to +125 °C, compliant with the ELV (End-of-Life Vehicle) Directive, supported by PPAP documentation, and meet Vishay Automotive Grade reliability requirements.

Q: Why are MDSA / MDSK suitable for motor drive and sensor applications?

A: MDSA / MDSK capacitors offer a wide capacitance range and high voltage withstand capability.. They can effectively filter out noise signals, reduce piezoelectric effects, and transmit valid signals, thereby effectively driving motor operation.

Q: Why are MDSA / MDSK easy to install?

A: MDSA / MDSK feature an axial / radial lead design that effectively relieves mechanical stress, making them particularly suitable for applications without printed circuit boards (PCBs).

Q: Why are MDSA / MDSK suitable for automotive speed sensors?

A: MDSA / MDSK capacitors offer a wide capacitance range and high voltage withstand capability. They can effectively filter out noise signals, reduce piezoelectric effects, and transmit valid signals, making them very suitable for speed sensors.

Q: Why are MDSA/MDSK suitable for wiper motor circuits?

A: MDSA / MDSK capacitors offer a wide capacitance range and high voltage withstand capability. They can effectively filter out noise signals, reduce piezoelectric effects, and transmit valid signals, thereby effectively driving wiper motor operation.

Q: Why are MDSA / MDSK suitable for power window motors?

A: MDSA / MDSK capacitors offer a wide capacitance range and high voltage withstand capability. They can effectively filter out noise signals, reduce piezoelectric effects, and transmit valid signals, thereby effectively driving window lift motor operation.

Q: What kind of ceramic capacitors do you have?

A:	TEMPERATURE COMPENSATING TYPE (CLASS1)	HIGH DIELECTRIC CONSTANT TYPE (CLASS2)	HIGH DIELECTRIC CONSTANT TYPE (CLASS2)
	Material	Calcium zirconate	Barium titanate
	Main temperature characteristics	C0G (small capacitance change due to temperature)	X7R (large capacitance change due to temperature)
	DC bias characteristics	No	Yes
	Aging characteristics	No	Yes
	Capacitance	Low relative dielectric constant and a small capacitance	High relative dielectric constant and a large capacitance can be obtained
	Main circuit application	For oscillation, tuning (filter), coupling, matching, etc.	For bypass circuits, smoothing, decoupling, coupling, etc.

Q: What is the application of ceramic capacitors?

A: Ceramic capacitors are used in various circuits for a variety of applications.
Four typical applications of ceramic capacitors are coupling, decoupling, smoothing, and filtering.

Q: How do you measure the capacitance of ceramic capacitors?

A: Normally, the capacitance of a ceramic capacitor is measured using an LCR meter. A typical measurement method using an LCR meter is the automatic balance bridge method.

Q: Do you have ceramic capacitors that can be substituted for electrolytic capacitors?

A: When comparing electrolytic capacitors and ceramic capacitors (MLCCs and lead type), ceramic capacitors have superior frequency characteristics compared to electrolytic capacitors. Therefore, when substituting a ceramic capacitor for an electrolytic capacitor, in some cases you can do so even if the ceramic capacitor does not necessarily have the same capacitance as the electrolytic capacitor depending on the frequency band being used.

Moreover, when substituting a ceramic capacitor for an electrolytic capacitor, it may cause abnormal oscillations due to the extremely small ESR of the ceramic capacitor. However, the oscillations can be suppressed by adjusting the constant of the phase compensation circuit.



When performing a substitution, it is possible to select the equivalent product from our company based on a description (series, capacitance, voltage, etc.) of the electrolytic capacitor as well as by verifying the impedance, etc. in the frequency band that will actually be used before inputting the required conditions in the and selecting the part numbers that meet the requirements.

Before performing a substitution, be sure to test with your own existing equipment that there are no problems when using the component.

Q: Are there ceramic capacitors that can be used to replace film capacitors?

A: The key feature of film capacitors is that changes in temperature or voltage do not cause much change in the capacitance.

The capacitance of temperature compensation type ceramic capacitors (MLCCs and lead type capacitors) also does not exhibit much change from changes in temperature or voltage.

When replacing a film capacitor with a Vishay ceramic capacitor, verify the specifications in the film capacitor description (series, capacitance, voltage, etc.) to choose a matching capacitor from our temperature compensation type ceramic capacitor lineup.

Please ensure there are no issues with your device before use.

Q: When a voltage more than the rating is applied to a ceramic capacitor, which is the failure mode, a short or open?

A: In general, if a failure occurs due to overvoltage, the capacitor will fail “short”, not “open”.

Q: Do you have data on Fit value, MTTF and MTBF?

A: Fit value and MTTF data can be provided.

MTBF data is generally used for products that can be repaired even if they fail. For components such as ceramic capacitors, MTBF data is not prepared because they are not used to repair and use them when they fail (break).

Q: I am considering connecting capacitors in series. Are there any issues in using them this way?

A: If the purpose of connecting the capacitors in series is for a fail-safe, it is appropriate. Confirm that the specification of both capacitors satisfies the circuit voltage you connect them to. Ascertain that the rated voltage of each capacitor connected in series is not below the circuit voltage.

Q: What is the function of a capacitor in a circuit?

A: A capacitor is an electronic component that stores and releases electricity in a circuit.

It also passes alternating current without passing direct current. A capacitor is an indispensable part of electronic equipment and is thus almost invariably used in an electronic circuit.