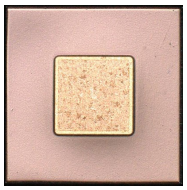
Si High Voltage Capacitors
500 V MACOM KV CAPS™

MACOM KV CAPS™

MKVC-5Ax Series
Rev. V3

Features

- High Working Voltage: 500 V
- Wide Range of Capacitance: 5.1 - 100 pF
- Excellent Stability
- RoHS* Compliant



Applications

- MACOM KV CAPS™ are suitable for use in resonant circuits, as DC blocks and as RF bypass capacitors.

Description

The MACOM KV CAPS™ Si high voltage capacitors feature very high working voltage ratings, very low loss and excellent stability by virtue of their novel internal construction and very high quality dielectric layers. These capacitors are available as unpackaged chips. The chips have gold bonding surfaces on both terminals to enable excellent bonding and minimum contact resistance.

The capacitance tolerance is ±5% of nominal value. Contact the factory for other tolerance values.

These capacitors have high insulation resistance, low dissipation factor and low temperature coefficient, as well as excellent long term stability.

Electrical Specifications:
Working Voltage = 500 V @ T_A = 25 °C

Part Number	Capacitance (pF)	Package Style
MKVC-5A05R1	5.1	1445
MKVC-5A05R6	5.6	1445
MKVC-5A06R2	6.2	1445
MKVC-5A06R8	6.8	1445
MKVC-5A07R5	7.5	1445
MKVC-5A08R2	8.2	1445
MKVC-5A09R1	9.1	1445
MKVC-5A10R0	10	1445
MKVC-5A11R0	11	1445
MKVC-5A12R0	12	1445
MKVC-5A13R0	13	1445
MKVC-5A15R0	15	1445
MKVC-5A16R0	16	1445
MKVC-5A18R0	18	1445
MKVC-5A20R0	20	1445
MKVC-5A22R0	22	1445
MKVC-5A24R0	24	1445
MKVC-5A27R0	27	1445
MKVC-5A30R0	30	1445
MKVC-5A33R0	33	1445
MKVC-5A36R0	36	1445

Electrical Specifications: Working Voltage = 500 V @ T_A = 25 °C

Part Number	Capacitance (pF)	Package Style
MKVC-5A39R0	39	1446
MKVC-5A43R0	43	1446
MKVC-5A47R0	47	1446
MKVC-5A51R0	51	1446
MKVC-5A56R0	56	1446
MKVC-5A62R0	62	1446
MKVC-5A68R0	68	1446
MKVC-5A75R0	75	1446
MKVC-5A82R0	82	1446
MKVC-5A91R0	91	1446
MKVC-5A0100	100	1446

Absolute Maximum Ratings[3,4]

Parameter	Absolute Maximum
Operating Temperature	-55°C to +175°C
Storage Temperature	-65°C to +200°C

3. Exceeding any one or more of these limits may cause permanent damage to this device.
4. MACOM does not recommend sustained operation near these survivability limits.

Assembly Instructions

MACOM KV CAPS™ may be attached to a circuit substrate using solder or conductive epoxy.

Solder Die Attach

Solder die attach may be accomplished using a eutectic solder, such as Au(80)/Sn(20), leaded solders such as Sn63Pb37 or with any of several RoHS-compatible solders such as Sn96.53Ag0.5Cu(SAC305), etc. For leaded or RoHS solder pastes it is recommended that a no-clean solder paste be used to prevent trapped fluxes which cannot be cleaned, as recommended by IPC-7093.

Conductive Epoxy Die Attach

MACOM recommends that the surface preparation and curing profiles provided by the manufacturer of the conductive epoxy should be followed. The typical epoxy bondline thickness is 0.0005 to 0.001 inches (12.5 to 25 µm). The curing temperature shall not exceed 350°C.

Refer to MACOM application note M541 for more information.

Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

Radiation Hardness

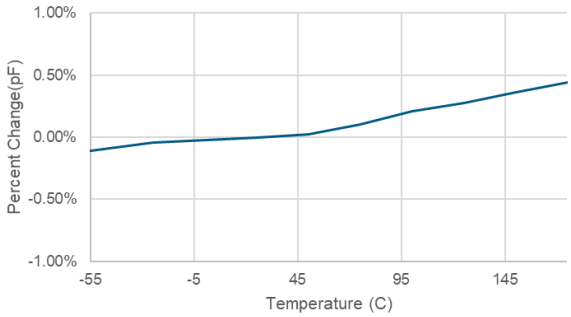
MACOM KV CAPS™ have been qualified to survive 300 krad(Si) total dose irradiation per MIL-STD-750 Method 1019.5, condition A.

Wire/Ribbon Bonding

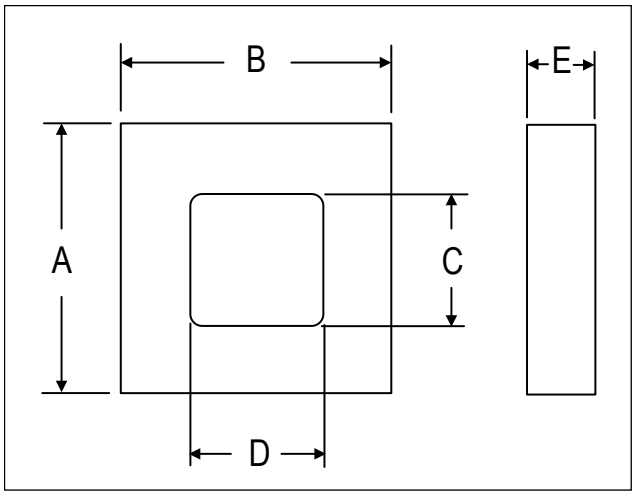
While the construction of the MACOM KV CAPS™ is very robust, it is recommended that wires or ribbons should be attached near to the center of the top contact to prevent mechanical damage, such as micro cracking, to the die which could degrade the working voltage capability of the die. Thermo-compression or ultrasonic bonding can be used. For most capacitance values, the top contact of the capacitor is sufficiently large to accept the attachment of multiple wires or ribbons. The top contact of the capacitor has a gold plating. Prior to wire or ribbon bonding, plasma cleaning may be required to remove any organic contaminants that could affect the quality of the bond interface.

Typical Performance Curves

Percent Change vs. Temperature



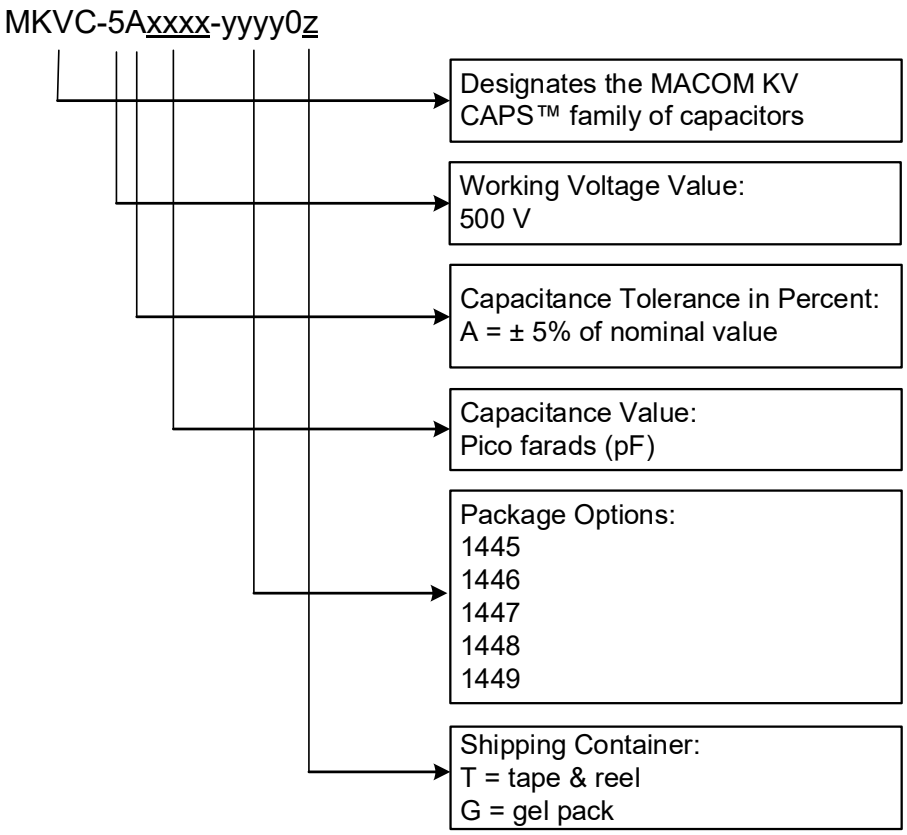
Outline Drawing (ODS 1445 - ODS 1449)



Dimensions (mils)

ODS#	A & B	C & D	E
1445	32	15	10
1446	40	24	10
1447	50	34	10
1448	64	48	10
1449	100	84	10

Ordering Information:



Example: MKVC-5A09R1-14390G specifies a particular part from the MACOM KV CAPS™ Series

- whose working voltage is 500 V
- whose capacitance tolerance is ± 5%,
- whose capacitance is 9.1 pF,
- whose die outline is ODS-1439
- which is shipped in a gel pack.