

# ROGERS

# MicroQ<sup>®</sup>

## DECOUPLING CAPACITORS

Micro/Q<sup>®</sup> decoupling capacitors are designed for use under dual-in-line integrated circuits. They provide an extremely low impedance, low inductance decoupling loop which results in significantly reduced voltage noise spikes. Compared to conventional decoupling capacitors, Micro/Q can cut noise by up to a factor of ten.

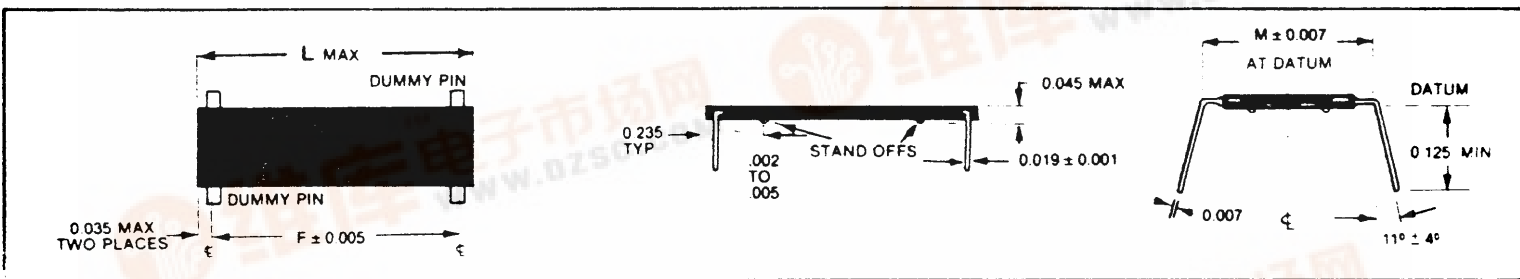
Since they share mounting holes with the IC pins, board design is simplified by eliminating the need to plan additional holes for standard capacitors. This feature also provides increased IC package density. Micro/Q allows the designer to use smaller boards with fewer holes, thus reducing board costs.

Micro/Q can be retrofitted with no board redesign to solve problems on existing products.

Micro/Q comes packaged in DIP tubes and is machine compatible for autoinsertion. Some temporary, removable modifications to existing autoinsertion machinery is necessary.



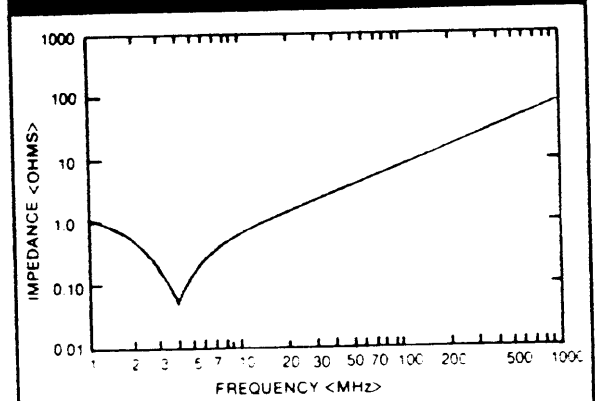
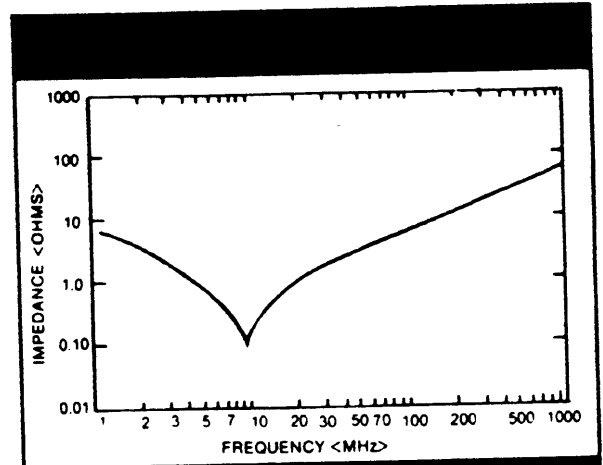
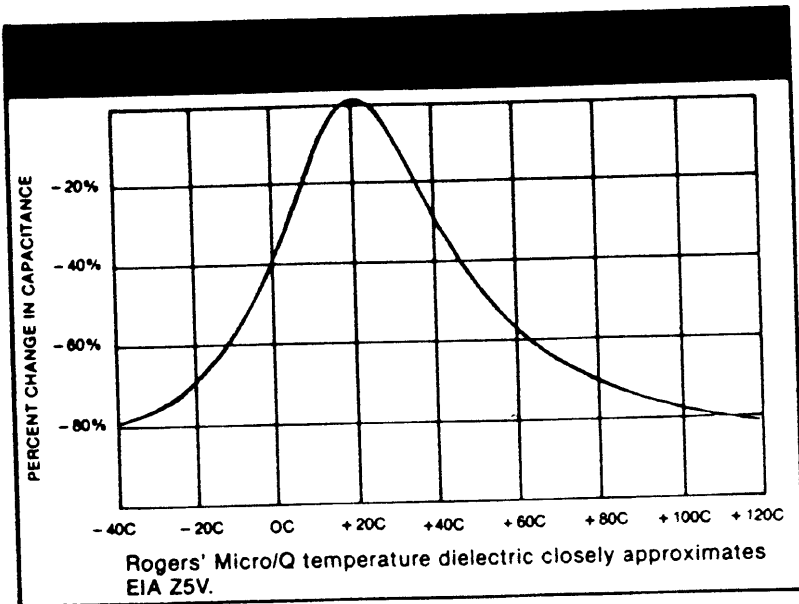
## STANDARD CONFIGURATIONS



ROGERS PART NUMBER	Nominal Capacitance	F Inches	M Inches	L MAX Inches	IC, DIP Width	Working Voltage
1ROGUQ01A	.02 uF	.6"	.280"	.670"	14, .3"	50 VDC
1ROGUQ02A	.03 uF	.7"	.280"	.770"	16, .3"	50 VDC
1ROGUQ03A	.03 uF	.8"	.280"	.870"	18, .3"	50 VDC
1ROGUQ04A	.03 uF	.9"	.280"	.970"	20, .3"	50 VDC
1ROGUQ15A	.03 uF	1.10"	.280"	1.170"	24, .3"	50 VDC
1ROGUQ06A	.03 uF	1.10"	.580"	1.170"	24, .6"	50 VDC
1ROGUQ07A	.07 uF	1.10"	.580"	1.170"	24, .6"	50 VDC
1ROGUQ08A	.03 uF	1.30"	.580"	1.370"	28, .6"	50 VDC
1ROGUQ09A	.07 uF	1.30"	.580"	1.370"	28, .6"	50 VDC
1ROGUQ10A	.03 uF	1.90"	.580"	1.970"	40, .6"	50 VDC
1ROGUQ11A	.07 uF	1.90"	.580"	1.970"	40, .6"	50 VDC
1ROGUQ12A	.10 uF	1.90"	.580"	1.970"	40, .6"	50 VDC
1ROGUQ13A	.14 uF	1.90"	.580"	1.970"	40, .6"	50 VDC



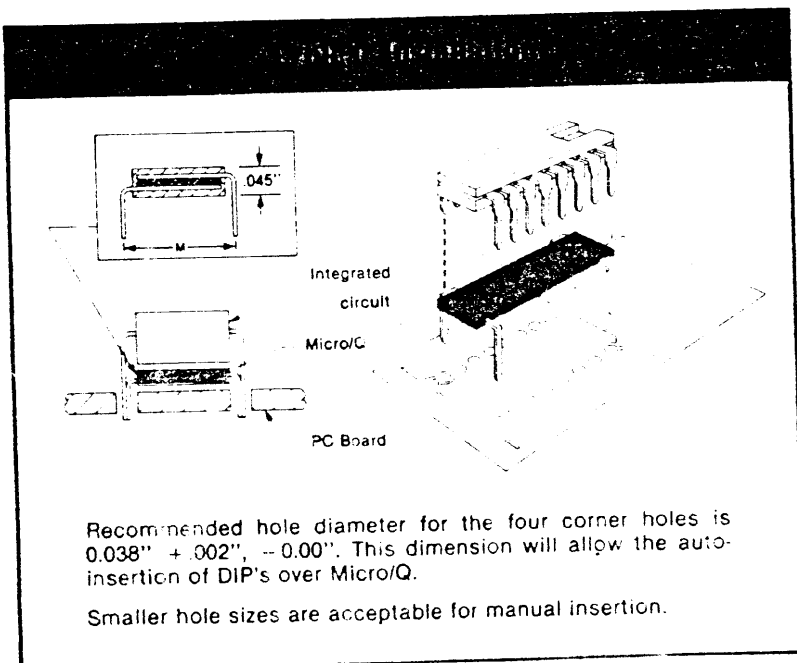
# SPECIFICATIONS



The low inductance of Micro/Q results in a low impedance over a wide range. This makes Micro/Q effective at decoupling a variety of frequencies.

Lower capacitance values (below 2000 pF), which are more effective in the higher frequencies (30-200 MHz), are also available.

D F	3.5% Max.
Working Voltage	50V DC
Breakdown	250V DC
I. R.	50 megohms min
Op. Temp. Range	-10° C to 85° C
Temp. Char.	Similar to Z5V
Cap. Tolerance	+100%, -25% at 25° C
Dummy Pin	
Capacitance	4 pF max.



## MIL-C-39014C, STD 202F

### PARAMETER

Thermal Shock	conforms
Life at elevated temp.	conforms
Low temp storage	conforms
Salt water immersion	conforms
Solderability	conforms
Resistance to solder heat	conforms

# ELECTRICAL PERFORMANCE

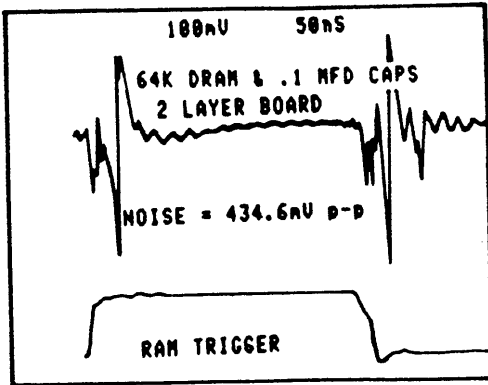


Fig. 1 0.1 uF Caps, 2 Layer Board

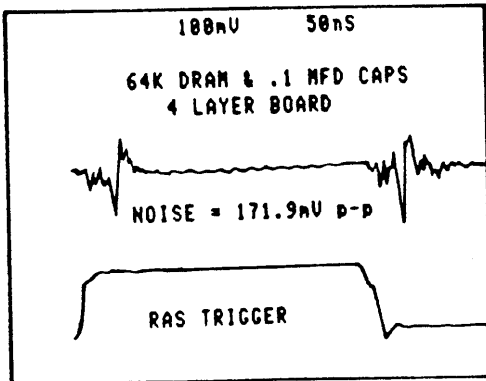


Fig. 2 0.1 uF Caps, 4 Layer Board

To exemplify the effectiveness of various decoupling schemes, an array of 64K DRAM chips was tested. Figure 1 shows a two sided PC board with 0.1 mfd. MLC capacitors at every device. Peak to peak spike noise was measured at 435 mV with little VCC sag noticeable. The second situation of 0.1 mfd. capacitors on a four layer PC board resulted in spike noise of 172 mV peak to peak and no noticeable VCC sag as shown in Figure 2. The third case shown in Figure 3 is of Micro/Q decoupling capacitors with nominal capacitance of 0.03 mfd. on a two sided board. The spike noise is its lowest yet at 156 mVpp due to much lower inductance. The sag level is measured at approximately 40 mV due to the lower capacitance value.

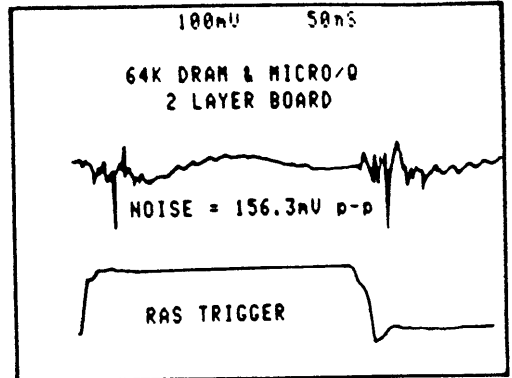


Fig. 3 0.03 uF Micro/Q, 2 Layer Board  
64K DRAM Decoupling Example

An important conclusion drawn from this example is that the key to reducing board level noise caused by IC current transients is to provide a low inductance decoupling scheme using a capacitor with capacitance value large enough to source required energy.

## PART MARKING AND ORDER INFORMATION

303 A 16 J5

- L Date code
- IC type or configuration (Eg: 16 = a 16 pin DIP)
- Dielectric characteristics (Eg: A = Z5V, 50 VDC, - 25, + 100%)
- Power of ten multiplier to give capacitance in pF
- First two significant figures of capacitance (Eg: 303 = 30,000 pF)

If you wish to place an order or require information regarding delivery, pricing, minimum order value, distributors, or would like a free sample, please contact Rogers Corp. at 602 967-0624 and ask for Customer Service.

Please order by Rogers part number as indicated on front page.

### Quantity per tube

1ROGUQ01A	33
1ROGUQ02A	28
1ROGUQ03A	25
1ROGUQ04A	22
1ROGUQ06A and 07A 15A	19
1ROGUQ08A and 09A	16
1ROGUQ10A and 11A 12A and 13A	11

WE HAVE ATTEMPTED TO PROVIDE ACCURATE INFORMATION ABOUT THE INDICATED ELECTRICAL CHARACTERISTICS AND MECHANICAL DIMENSIONS OF THIS PRODUCT AS OF THE PUBLICATION DATE. THIS INFORMATION IS NOT INTENDED TO AND DOES NOT CREATE ANY WARRANTIES, EXPRESS OR IMPLIED.

INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. USERS SHOULD MAKE THEIR OWN TESTS TO DETERMINE THE SUITABILITY OF THIS PRODUCT FOR INTENDED USES. ROGERS CORPORATION RESERVES THE RIGHT TO CHANGE SPECIFICATIONS AT ANY TIME WITHOUT NOTICE.

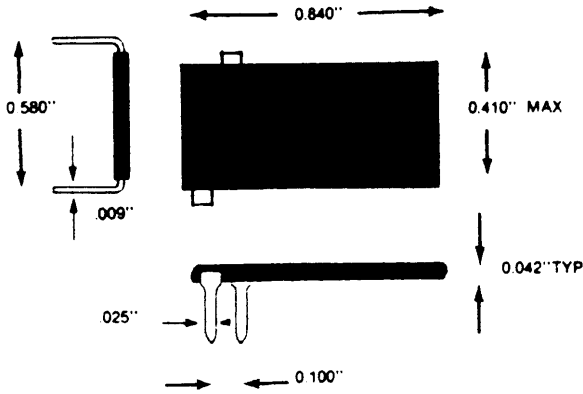
**ROGERS**

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2400 South Roosevelt Street, Tempe, AZ 85282  
602 967-0624

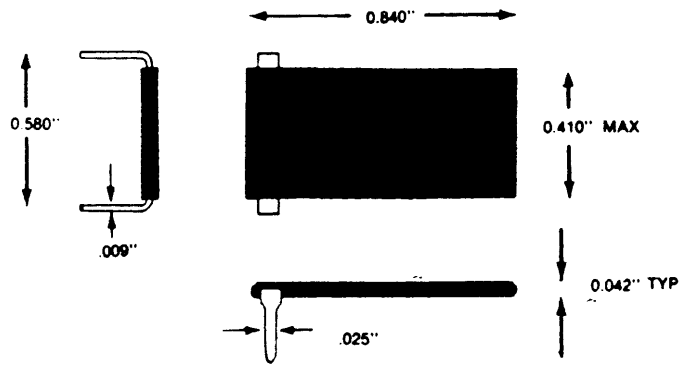
MERTON  
CIRCUIT SYSTEMS LIMITED  
116 Kingston Road  
Leatherhead, Surrey KT22 7SL  
Tel: (0872) 378231 Telex: 926 872

# SPECIAL CONFIGURATIONS

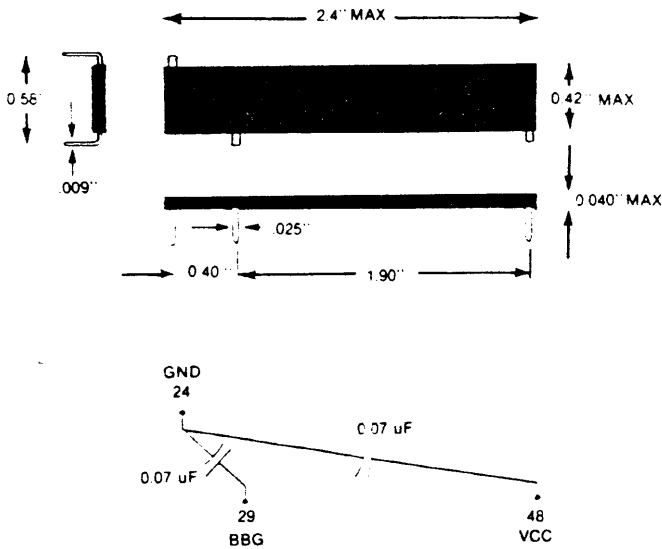
The Rogers 1ROGUQ27Z is a standard product designed for use with Z80, 2901, F9445, NEC780 and any other wide body DIPs where power and ground pins are located as shown below. Capacitance is .07 uF.



The Rogers 1ROGUQ22Z is a standard product designed for use with Z8002, TMS9995, 2903 and other wide body DIPs where power and ground pins directly oppose each other. Capacitance is .07 uF.

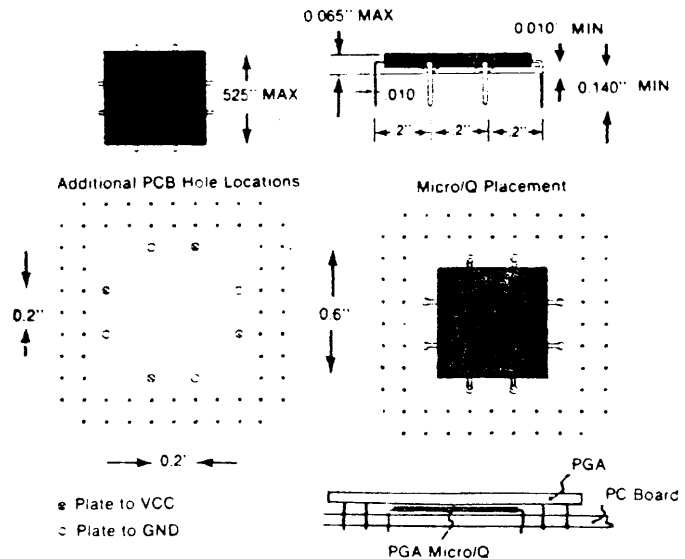


The Rogers Micro/Q 1NSCUQ01Z is designed for use with National Semi NS32016 and Texas Instrument's TI32016. It applies .07 uF between BBG and GND and between VCC and GND. Standard Micro/Q complement other 32000 family peripherals.

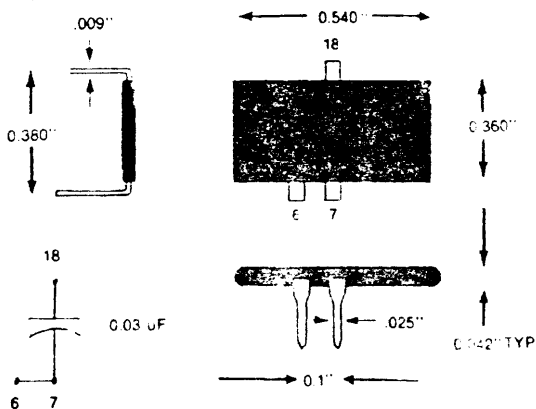


Rogers' Micro/Q 1PGAUQ06Z is designed for placement under Pin Grid Array packages and Leadless Chip Carrier sockets where additional PCB holes can be placed on 0.6 inch square with spacing as shown below. Examples of this are Intel's 80286 in a 68 lead PGA, Motorola's MC68020 in a 114 lead PGA and National's NS32032 in a 68 LCC package.

PGA Micro/Q can be designed into multilayer boards by adding holes plated to internal power and ground planes. Currently available with .05 uF nominal capacitance.



Rogers' 1ROGUQ30Z is designed for the ECL 24 pin DIP. Currently available with .03 uF nominal capacitance.



Rogers' capacitive products division manufactures a variety of other pin outs and capacitances to solve PCB decoupling problems. Continuing product development and manufacturing refinements promise superior products for the future.

If you require additional information or design help, please call Rogers Corporation, 602-967-0624 and ask for technical assistance.

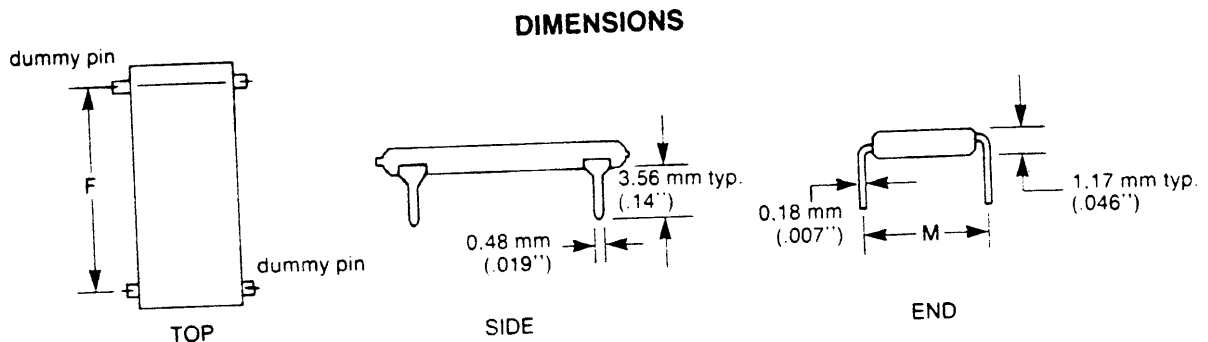
# Micro⚡Q™

## A-SERIES DATA SHEET

### DECOUPLING CAPACITORS

MICRO/Q™ decoupling capacitors are designed for use directly under dual-in-line integrated circuits. Extremely low inductance and impedance provide superior decoupling compared to conventional decoupling capacitors.

Additionally, horizontal mounting allows increased IC package density on both two-sided and multilayer printed circuit boards.



**DATA TABLE**

MICRO/Q Part Number	F mm (Inches)	M mm (Inches)	Nominal Capacitance	IC DIP Package
μQ-14.02	15.24 (.60)	7.11 (.28)	.02 μf	14 pins, .300 centers
μQ-16.03	17.78 (.70)	7.11 (.28)	.03 μf	16 pins, .300 centers
μQ-18.03	20.32 (.80)	7.11 (.28)	.03 μf	18 pins, .300 centers
μQ-20.03	22.86 (.90)	7.11 (.28)	.03 μf	20 pins, .300 centers
μQ-22.03	25.40 (1.0)	9.65 (.38)	.03 μf	22 pins, .400 centers
μQ-22S03	25.40 (1.0)	7.11 (.28)	.03 μf	22 pins, .300 centers
μQ-24.03	27.94 (1.10)	14.73 (.58)	.03 μf	24 pins, .600 centers
μQ-24S03	27.94 (1.10)	7.11 (.28)	.03 μf	24 pins, .300 centers
μQ-24.07	27.94 (1.10)	14.73 (.58)	.07 μf	24 pins, .600 centers
μQ-28.03	33.02 (1.30)	14.73 (.58)	.03 μf	28 pins, .600 centers
μQ-28.07	33.02 (1.30)	14.73 (.58)	.07 μf	28 pins, .600 centers
μQ-40.03	48.26 (1.90)	14.73 (.58)	.03 μf	40 pins, .600 centers
μQ-40.07	48.26 (1.90)	14.73 (.58)	.07 μf	40 pins, .600 centers
μQ-40.10	48.26 (1.90)	14.73 (.58)	.10 μf	40 pins, .600 centers

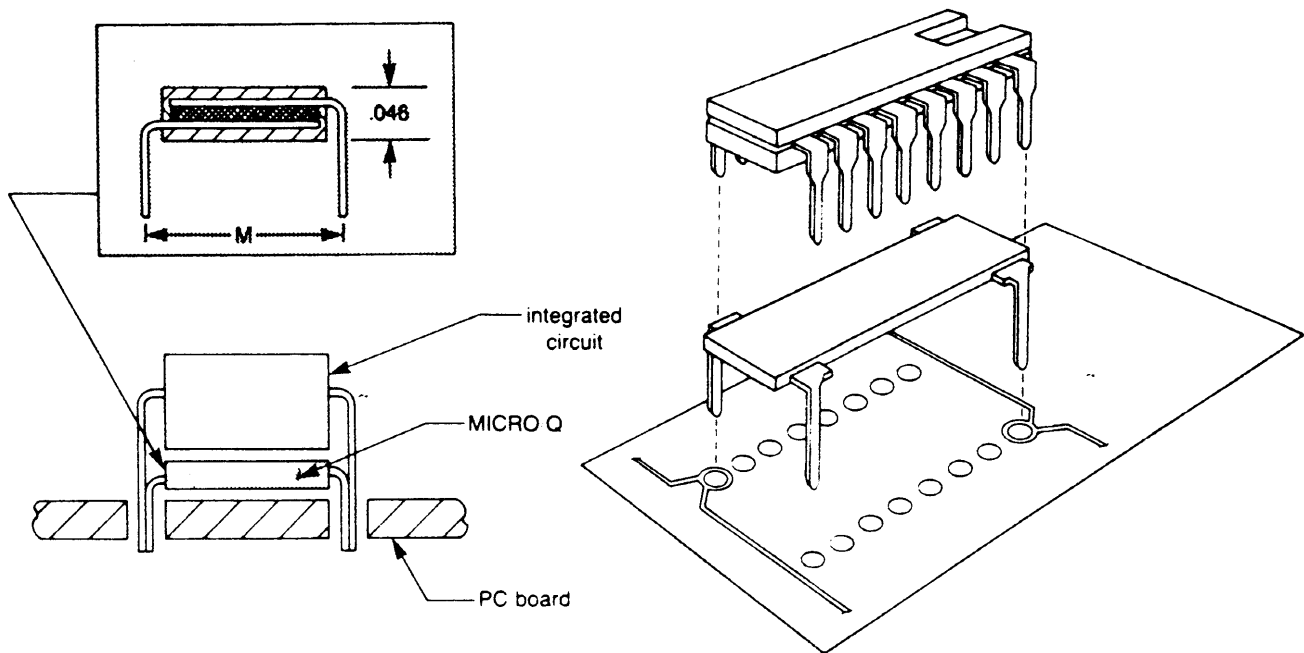
The new Micro/Q A-Series decoupling capacitors have two electrically neutral pins, diagonally opposite the

and ground pins, to facilitate both manual and autoinsertion.



# DECOUPLING CAPACITORS

## TYPICAL INSTALLATION



## SPECIFICATIONS

WORKING VOLTAGE:	Maximum working voltage is 50 VDC
STORAGE TEMPERATURE:	-55°C to +105°C
CHARACTERISTICS:	Similar to EIA grade Z5V
CAPACITANCE:	Nominal capacitance is measured at 1.0 KHz, 25°C, 1.0 ± 0.5 VRMS. Each capacitance value has a +100%, -25% tolerance.

We have attempted to provide accurate information about the indicated electrical characteristics and mechanical dimensions of this product as of the publication date. Users should make their own tests to determine

the suitability of this product for intended uses. Mektron reserves the right to change specifications at any time without notice.

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