

# Hi-Q® High RF Power MLC Surface Mount Capacitors

For 600V to 7200V Applications



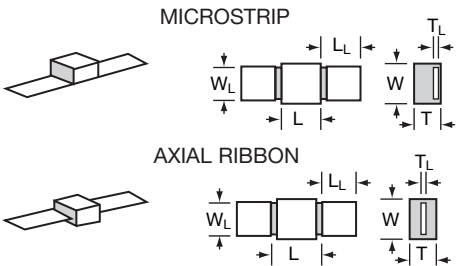
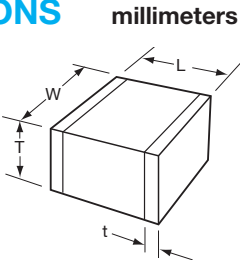
## PRODUCT OFFERING

Hi-Q®, high RF power, surface mount MLC capacitors from AVX Corporation are characterized with ultra-low ESR and dissipation factor at high frequencies. They are designed to handle high power and high voltage levels for applications in RF power amplifiers, inductive heating, high magnetic field environments (MRI coils), medical and industrial electronics.

## HOW TO ORDER

| HQCC             | A              | A                              | 271                                                                           | J                            | A                 | T                                     | 1A               |
|------------------|----------------|--------------------------------|-------------------------------------------------------------------------------|------------------------------|-------------------|---------------------------------------|------------------|
| <b>AVX Style</b> | <b>Voltage</b> | <b>Temperature Coefficient</b> | <b>Capacitance Code</b><br>(2 significant digits + no. of zeros)<br>Examples: | <b>Capacitance Tolerance</b> | <b>Test Level</b> | <b>Termination*</b>                   | <b>Packaging</b> |
| HQCC             | 300V = 9       | C0G = A                        | 4.7 pF = 4R7                                                                  | B = 0.1pF (<8.2pF)           | A = Standard      | T = Plated Ni and Sn (RoHS Compliant) | 1A = 7" Reel*    |
| HQCE             | 500V = 7       | P90 = M                        | 10 pF = 100                                                                   | C = ±0.25pF (<8.2pF)         |                   | J = 5% Min Pb                         | 6A = Waffle Pack |
| HQLC             | 800V = U       |                                | 100 pF = 101                                                                  | D = ±0.50pF (<8.2pF)         |                   | 7 = Plated Ni and Au                  |                  |
| HQLE             | 1000V = A      |                                | 1,000 pF = 102                                                                | F = ±1% (≥10pF)              |                   | A = Axial Ribbon                      |                  |
|                  | 1500V = S      |                                |                                                                               | G = ±2%                      |                   | M = Microstrip                        |                  |
|                  | 2500V = W      |                                |                                                                               | J = ±5%                      |                   | H = Cu/Sn (Non-Magnetic)              |                  |
|                  | 3000V = H      |                                |                                                                               | K = ±10%                     |                   | 4 = Axial Ribbon (Non-Magnetic)       |                  |
|                  | 3600V = J      |                                |                                                                               | M = ±20%                     |                   | 5 = Microstrip (Non-Magnetic)         |                  |
|                  | 5000V = K      |                                |                                                                               |                              |                   |                                       |                  |
|                  | 7200V = M      |                                |                                                                               |                              |                   |                                       |                  |

## DIMENSIONS



| STYLE              | HQCC                                                                                                 | HQCE                                      |
|--------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------|
| (L) Length         | 5.84 +0.51 -0.25<br>(0.230 +0.020 -0.010)                                                            | 9.65 +0.38 -0.25<br>(0.380 +0.015 -0.010) |
| (W) Width          | 6.35 ± 0.38<br>(0.250 ± 0.015)                                                                       | 9.65 ± 0.25<br>(0.380 ± 0.010)            |
| (T) Thickness Max. | 3.68 (0.145) max. for capacitance values ≤ 680pF<br>4.19 (0.165) max. for capacitance values > 680pF | 4.32 (0.170) max.                         |
| (Y) Overlap        | 1.20 ± (0.040) max.                                                                                  | 1.02 ± (0.040) max.                       |

| STYLE                            | HQLC                                                                                                 | HQLE                                                                        |
|----------------------------------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| (L) Length                       | 6.22 ± 0.64<br>(0.245 ± 0.025)                                                                       | 9.65 +0.89 -0.25<br>(0.380 +0.035 -0.010)                                   |
| (W) Width                        | 6.35 ± 0.38<br>(0.250 ± 0.015)                                                                       | 9.65 ± 0.25<br>(0.380 ± 0.010)                                              |
| (T) Thickness Max.               | 3.68 (0.145) max. for capacitance values ≤ 680pF<br>4.19 (0.165) max. for capacitance values ≤ 680pF | 4.32 (0.170) max.                                                           |
| (Y) Overlap                      | N/A                                                                                                  | N/A                                                                         |
| (L <sub>L</sub> ) Lead Length    | 12.7 min.<br>(0.500)                                                                                 | 19.05<br>(0.750)                                                            |
| (W <sub>L</sub> ) Lead Width     | 6.10 ± 0.127<br>(0.240 ± 0.005)                                                                      | 8.89 ± 0.25<br>(0.350 ± 0.010)                                              |
| (T <sub>L</sub> ) Lead Thickness | 0.102 ±0.025<br>(0.004 ± 0.001)                                                                      | 0.25 ± 0.13<br>(0.010 ±0.005)                                               |
| Lead Material                    | High Purity Silver Leads<br>Leads are attached with High Temperature Solder                          | High Purity Silver Leads<br>Leads are attached with High Temperature Solder |

Not RoHS Compliant



For RoHS compliant products,  
please select correct termination style.



# Hi-Q® High RF Power MLC Surface Mount Capacitors

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## DIELECTRIC PERFORMANCE CHARACTERISTICS

|                                    |                                                                                                                                                                                                                                       |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Capacitance Range</b>           | 1.0pF to 2,700pF<br>(25°C, 1.0 ±0.2 Vrms at 1kHz, for ≤ 1000 pF use 1MHz)                                                                                                                                                             |
| <b>Capacitance Tolerances</b>      | ±0.10pF, ±0.25pF, ±0.50pF, ±1%, ±2%, ±5%, ±10%, ±20%                                                                                                                                                                                  |
| <b>Dissipation Factor 25°C</b>     | 0.1% Max (+25°C, 1.0 ±0.2 Vrms at 1kHz, for ≤ 1000 pF use 1MHz)                                                                                                                                                                       |
| <b>Operating Temperature Range</b> | -55°C to +125°C                                                                                                                                                                                                                       |
| <b>Temperature Characteristic</b>  | C0G: 0 ± 30 ppm/°C (-55°C to +125°C), P90: 90 ± 30 ppm/°C (-55°C to +125°C)                                                                                                                                                           |
| <b>Insulation Resistance</b>       | 100K MΩ min. @ +25°C and 500VDC<br>10K MΩ min. @ +125°C and 500VDC                                                                                                                                                                    |
| <b>Dielectric Strength</b>         | 250% of WVDC for capacitors rated at 500 volts DC or less for 5 seconds.<br>150% of WVDC for capacitors rated at 1250 volts DC or less for 5 seconds.<br>120% of WVDC for capacitors rated above 1250 volts DC or less for 5 seconds. |

## HQCC CAPACITANCE VALUES (A DIELECTRIC)

| Cap Code | Cap (pF) | Tol.    | Rated WVDC | Cap Code | Cap (pF) | Tol.    | Rated WVDC | Cap Code | Cap (pF) | Tol.            | Rated WVDC | Cap Code | Cap (pF) | Tol.            | Rated WVDC |
|----------|----------|---------|------------|----------|----------|---------|------------|----------|----------|-----------------|------------|----------|----------|-----------------|------------|
| 1R0      | 1.0      | B, C, D | 2500       | 8R2      | 8.2      | B, C, D | 2500       | 680      | 68       | F, G, J<br>K, M | 2500       | 471      | 470      | F, G, J<br>K, M | 1500       |
| 1R2      | 1.2      |         |            | 100      | 10       | 820     |            | 82       | 561      |                 |            | 560      | 1000     |                 |            |
| 1R5      | 1.5      |         |            | 120      | 12       | 101     |            | 100      | 681      |                 |            | 680      |          |                 |            |
| 1R8      | 1.8      |         |            | 150      | 15       | 121     |            | 120      | 821      |                 |            | 820      |          |                 |            |
| 2R2      | 2.2      |         |            | 180      | 18       | 151     |            | 150      | 102      |                 |            | 1000     |          |                 |            |
| 2R7      | 2.7      |         |            | 220      | 22       | 181     |            | 180      | 122      |                 |            | 1200     |          |                 |            |
| 3R3      | 3.3      |         |            | 270      | 27       | 221     |            | 220      | 152      |                 |            | 1500     | 500      |                 |            |
| 3R9      | 3.9      |         |            | 330      | 33       | 271     |            | 270      | 182      |                 |            | 1800     | 300      |                 |            |
| 4R7      | 4.7      |         |            | 390      | 39       | 331     |            | 330      | 1500     |                 | 222        | 2200     |          |                 |            |
| 5R6      | 5.6      | 470     | 47         | 391      | 390      | 272     | 2700       |          |          |                 |            |          |          |                 |            |
| 6R8      | 6.8      |         |            | 560      | 56       |         |            |          |          |                 |            |          |          |                 |            |

## HQCC CAPACITANCE VALUES (M DIELECTRIC)

| Cap Code | Cap (pF) | Tol.    | Rated WVDC |          | Cap Code | Cap (pF) | Tol.            | Rated WVDC |          | Cap Code | Cap (pF) | Tol.            | Rated WVDC |          |
|----------|----------|---------|------------|----------|----------|----------|-----------------|------------|----------|----------|----------|-----------------|------------|----------|
|          |          |         | Standard   | Extended |          |          |                 | Standard   | Extended |          |          |                 | Standard   | Extended |
| 1R0      | 1.0      | B, C, D | 2500       | 3600     | 100      | 10       | F, G, J<br>K, M | 2500       | 3600     | 161      | 160      | F, G, J<br>K, M | 2500       | 3000     |
| 1R1      | 1.1      |         |            |          | 110      | 11       |                 |            |          | 181      | 180      |                 |            |          |
| 1R2      | 1.2      |         |            |          | 120      | 12       |                 |            |          | 201      | 200      |                 |            |          |
| 1R3      | 1.3      |         |            |          | 130      | 13       |                 |            |          | 221      | 220      |                 |            |          |
| 1R4      | 1.4      |         |            |          | 150      | 15       |                 |            |          | 241      | 240      |                 |            |          |
| 1R5      | 1.5      |         |            |          | 160      | 16       |                 |            |          | 271      | 270      |                 |            |          |
| 1R6      | 1.6      |         |            |          | 180      | 18       |                 |            |          | 301      | 300      |                 |            |          |
| 1R7      | 1.7      |         |            |          | 200      | 20       |                 |            |          | 331      | 330      |                 | 1500       | 2000     |
| 1R8      | 1.8      |         |            |          | 220      | 22       |                 |            |          | 331      | 330      |                 |            |          |
| 1R9      | 1.9      |         |            |          | 240      | 24       |                 |            |          | 361      | 360      |                 |            |          |
| 2R0      | 2.0      |         |            |          | 270      | 27       |                 |            |          | 391      | 390      |                 |            |          |
| 2R1      | 2.1      |         |            |          | 300      | 30       |                 |            |          | 431      | 430      |                 |            |          |
| 2R2      | 2.2      |         |            |          | 330      | 33       |                 |            |          | 471      | 470      |                 |            |          |
| 2R4      | 2.4      |         |            |          | 360      | 36       |                 |            |          | 511      | 510      |                 | 1000       | 1500     |
| 2R5      | 2.5      |         |            |          | 390      | 39       |                 |            |          | 561      | 560      |                 |            |          |
| 3R0      | 3.0      |         |            |          | 430      | 43       |                 |            |          | 621      | 620      |                 |            |          |
| 3R3      | 3.3      |         |            |          | 470      | 47       |                 |            |          | 681      | 680      |                 |            |          |
| 3R6      | 3.6      |         |            |          | 510      | 51       |                 |            |          | 751      | 750      |                 |            |          |
| 3R9      | 3.9      |         |            |          | 560      | 56       |                 |            |          | 821      | 820      |                 |            |          |
| 4R3      | 4.3      |         |            |          | 620      | 62       |                 |            |          | 911      | 910      |                 |            |          |
| 4R7      | 4.7      |         |            |          | 680      | 68       |                 |            |          | 102      | 1000     |                 | 500        | 800      |
| 5R1      | 5.1      |         |            |          | 750      | 75       |                 |            |          | 112      | 1100     |                 |            |          |
| 5R6      | 5.6      |         |            |          | 820      | 82       |                 |            |          | 122      | 1200     |                 |            |          |
| 6R2      | 6.2      |         |            |          | 910      | 91       |                 |            |          | 152      | 1500     |                 | 300        | 500      |
| 6R8      | 6.8      |         |            |          | 101      | 100      |                 |            |          | 182      | 1800     |                 |            |          |
| 7R5      | 7.5      |         |            |          | 111      | 110      |                 |            |          | 222      | 2200     |                 |            |          |
| 8R2      | 8.2      |         |            |          | 121      | 120      |                 |            |          | 242      | 2400     |                 |            |          |
| 9R1      | 9.1      |         |            |          | 131      | 130      |                 |            |          | 272      | 2700     |                 |            |          |
|          |          |         |            |          | 151      | 150      |                 |            |          |          |          |                 |            |          |

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For 600V to 7200V Applications



## HQCE CAPACITANCE VALUES (A DIELECTRIC)

| Cap Code | Cap (pF) | Tol.       | Rated WVDC |          | Cap Code | Cap (pF) | Tol.       | Rated WVDC |          | Cap Code | Cap (pF) | Tol.       | Rated WVDC |          |
|----------|----------|------------|------------|----------|----------|----------|------------|------------|----------|----------|----------|------------|------------|----------|
|          |          |            | Standard   | Extended |          |          |            | Standard   | Extended |          |          |            | Standard   | Extended |
| 1R0      | 1.0      | C, D       | 3600       | 7200     | 150      | 15       | G, J, K, M | 3600       | 7200     | 221      | 220      | G, J, K, M | 3600       | NA       |
| 1R2      | 1.2      |            |            |          | 180      | 18       |            |            |          | 271      | 270      |            |            |          |
| 1R5      | 1.5      |            |            |          | 220      | 22       |            |            |          | 331      | 330      |            |            |          |
| 1R8      | 1.8      |            |            |          | 270      | 27       |            |            |          | 391      | 390      |            |            |          |
| 2R2      | 2.2      |            |            |          | 330      | 33       |            |            |          | 471      | 470      |            |            |          |
| 2R7      | 2.7      |            |            |          | 390      | 39       |            |            |          | 561      | 560      |            |            |          |
| 3R3      | 3.3      |            |            |          | 470      | 47       |            |            | 681      | 680      |          |            |            |          |
| 3R9      | 3.9      |            |            |          | 560      | 56       |            |            | 821      | 820      |          |            |            |          |
| 4R7      | 4.7      |            |            |          | 680      | 68       |            |            | 102      | 1000     |          |            |            |          |
| 5R6      | 5.6      | G, J, K, M | 3600       | 7200     | 122      | 1200     |            |            |          |          |          |            |            |          |
| 6R8      | 6.8      |            |            |          | 152      | 1500     |            |            |          |          |          |            |            |          |
| 8R2      | 8.2      |            |            |          | 182      | 1800     |            |            |          |          |          |            |            |          |
| 100      | 10       |            |            |          | 222      | 2200     |            |            |          |          |          |            |            |          |
| 120      | 12       |            |            |          |          |          |            |            |          |          |          |            |            |          |
|          |          |            |            |          |          |          |            |            |          |          |          |            |            |          |

## HQCE CAPACITANCE VALUES (M DIELECTRIC)

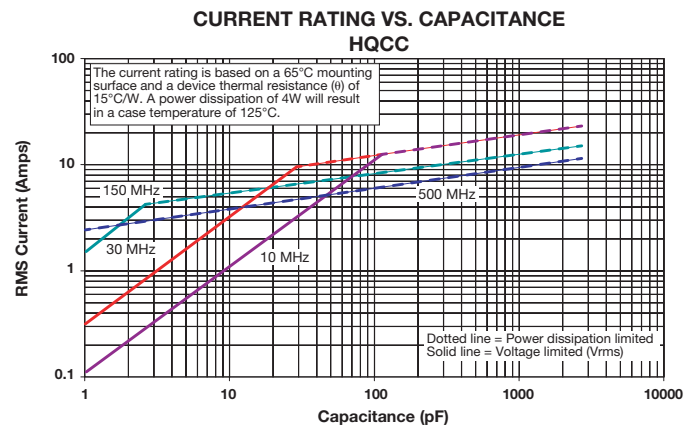
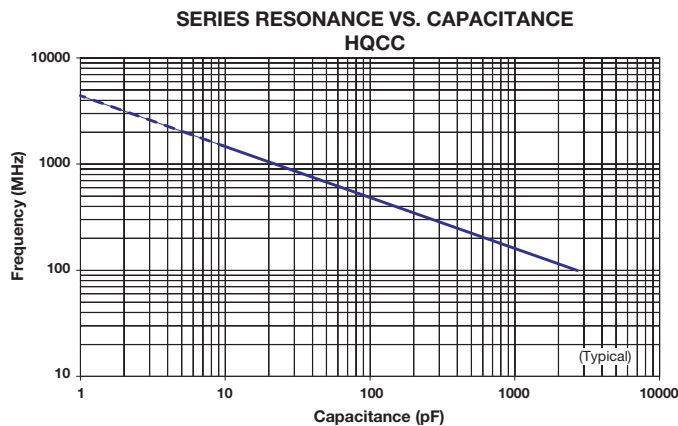
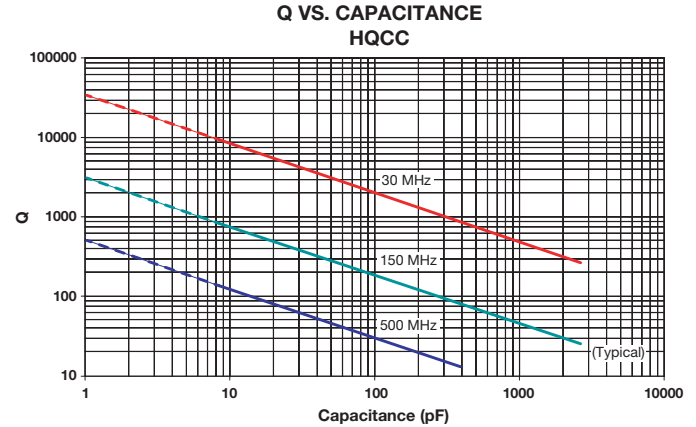
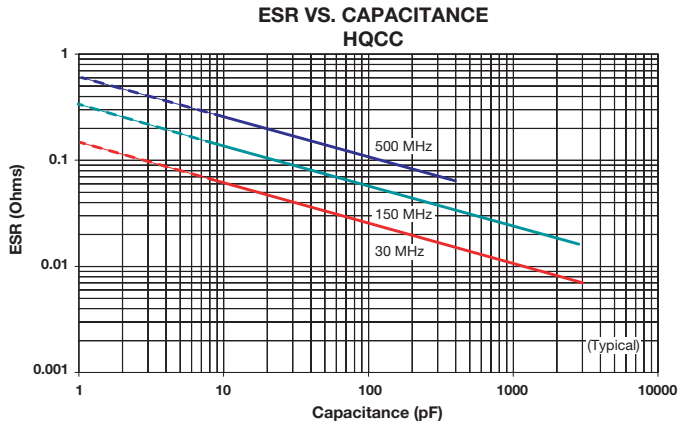
| Cap Code | Cap (pF) | Tol.    | Rated WVDC |          | Cap Code | Cap (pF) | Tol.          | Rated WVDC |          | Cap Code | Cap (pF) | Tol.          | Rated WVDC |          |
|----------|----------|---------|------------|----------|----------|----------|---------------|------------|----------|----------|----------|---------------|------------|----------|
|          |          |         | Standard   | Extended |          |          |               | Standard   | Extended |          |          |               | Standard   | Extended |
| 1R0      | 1.0      | B, C, D | 3600       | 7200     | 180      | 18       | F, G, J, K, M | 3600       | 7200     | 331      | 330      | F, G, J, K, M | 3600       | NA       |
| 1R2      | 1.2      |         |            |          | 220      | 22       |               |            |          | 391      | 390      |               |            |          |
| 1R5      | 1.5      |         |            |          | 270      | 27       |               |            |          | 471      | 470      |               |            |          |
| 1R8      | 1.8      |         |            |          | 330      | 33       |               |            |          | 561      | 560      |               | 2500       |          |
| 2R2      | 2.2      |         |            |          | 390      | 39       |               |            |          | 681      | 680      |               |            |          |
| 2R7      | 2.7      |         |            |          | 470      | 47       |               |            |          | 821      | 820      |               | 1000       |          |
| 3R3      | 3.3      |         |            |          | 560      | 56       |               |            |          | 102      | 1000     |               |            |          |
| 3R9      | 3.9      |         |            |          | 680      | 68       |               |            |          | 122      | 1200     |               |            |          |
| 4R7      | 4.7      |         |            |          | 820      | 82       |               |            |          | 152      | 1500     |               |            |          |
| 5R6      | 5.6      |         |            |          | 101      | 100      |               |            |          | 182      | 1800     |               |            |          |
| 6R8      | 6.8      | 121     | 120        | 222      | 2200     |          |               |            |          |          |          |               |            |          |
| 8R2      | 8.2      | 151     | 150        | 272      | 2700     | 500      |               |            |          |          |          |               |            |          |
| 100      | 10       | 181     | 180        | 332      | 3300     |          |               |            |          |          |          |               |            |          |
| 120      | 12       | 221     | 220        | 472      | 4700     |          |               |            |          |          |          |               |            |          |
| 150      | 15       | 271     | 270        | 512      | 5100     |          |               |            |          |          |          |               |            |          |

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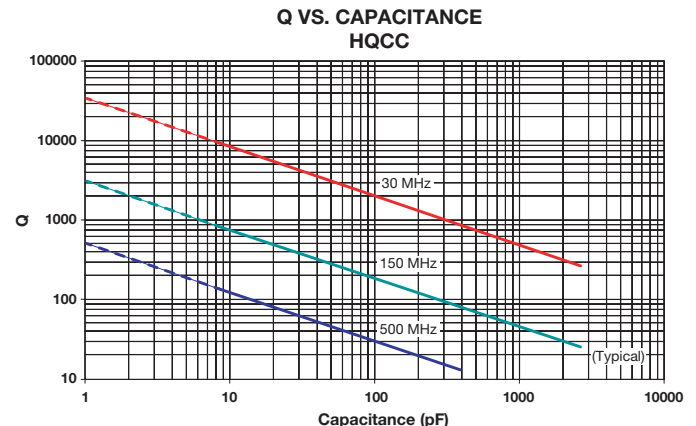
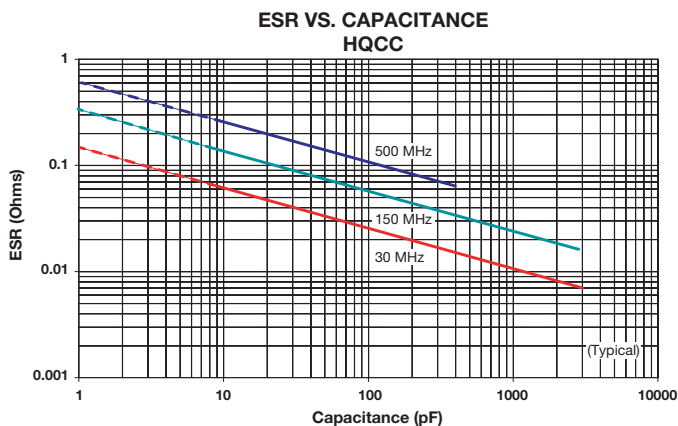
For 600V to 7200V Applications



## HQCC PERFORMANCE CHARACTERISTICS (A DIELECTRIC)

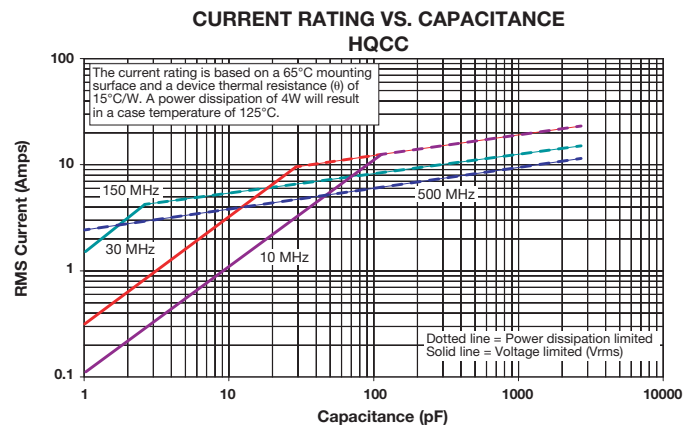
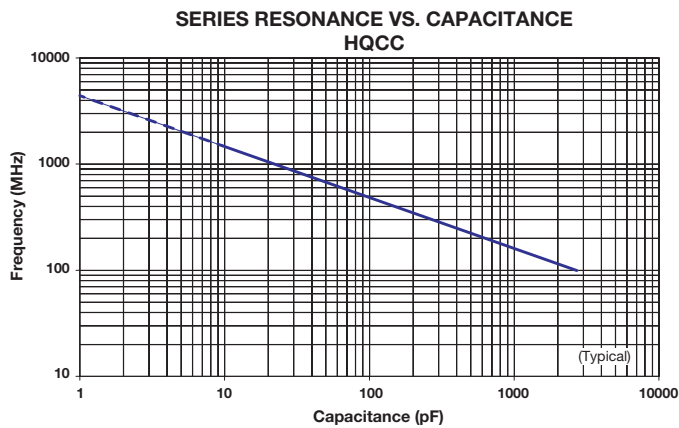


## HQCC PERFORMANCE CHARACTERISTICS (M DIELECTRIC)

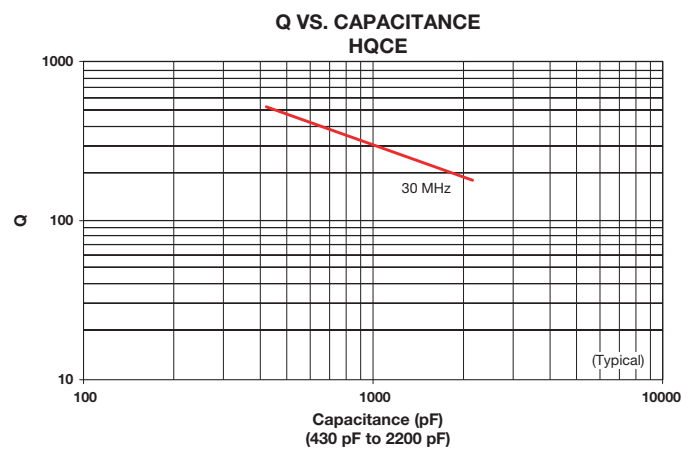
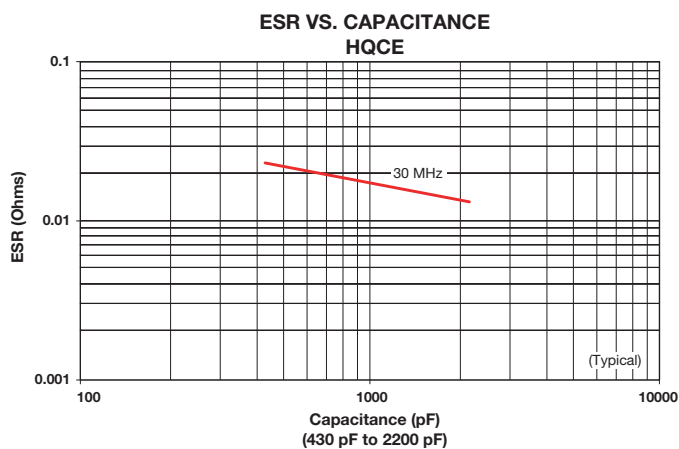
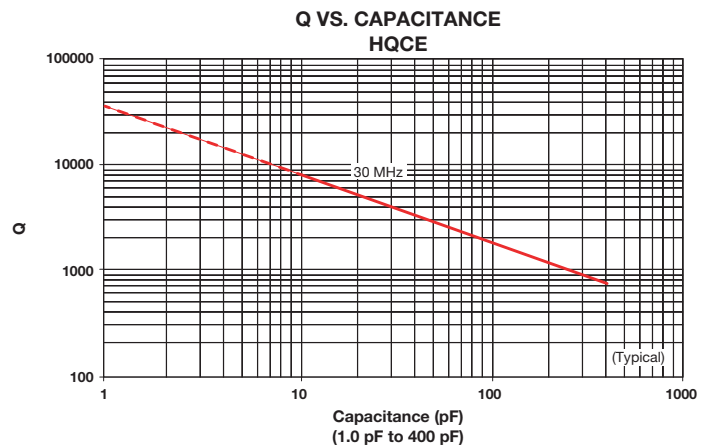
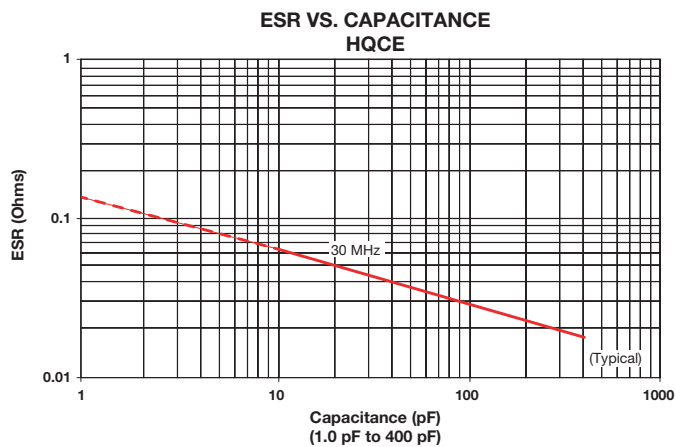


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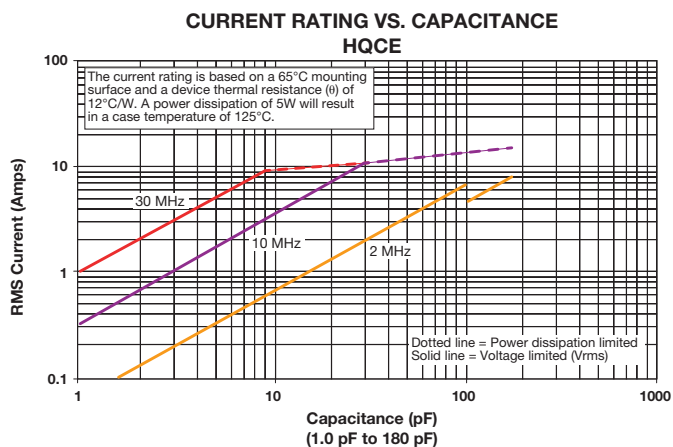
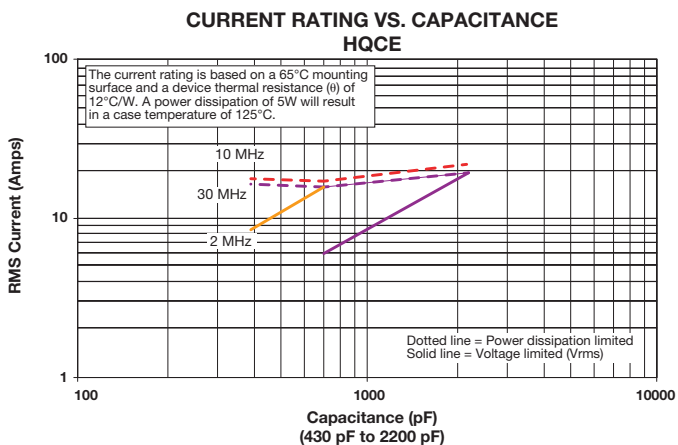
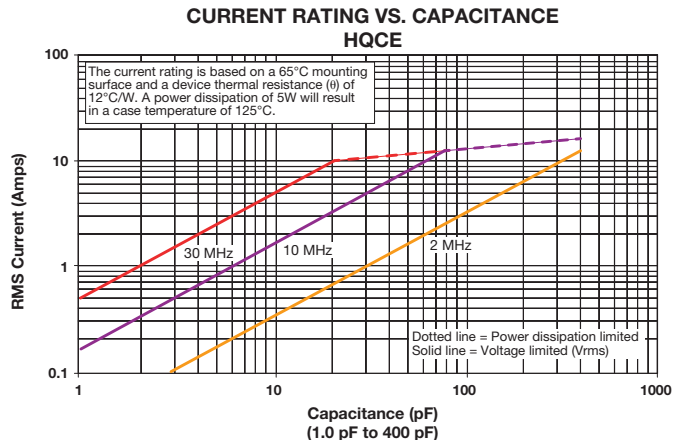
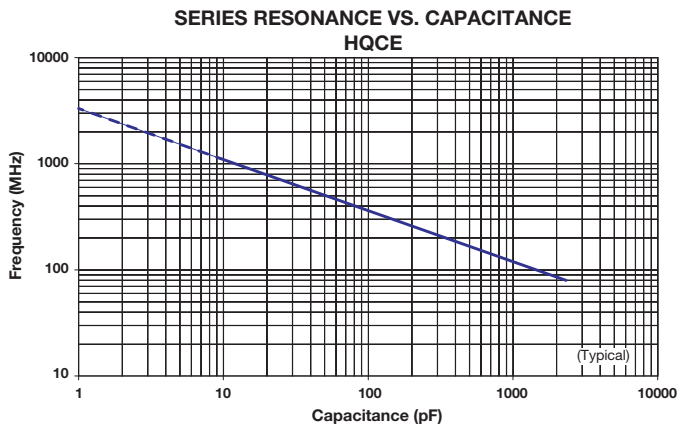


## HQCE PERFORMANCE CHARACTERISTICS (A DIELECTRIC)

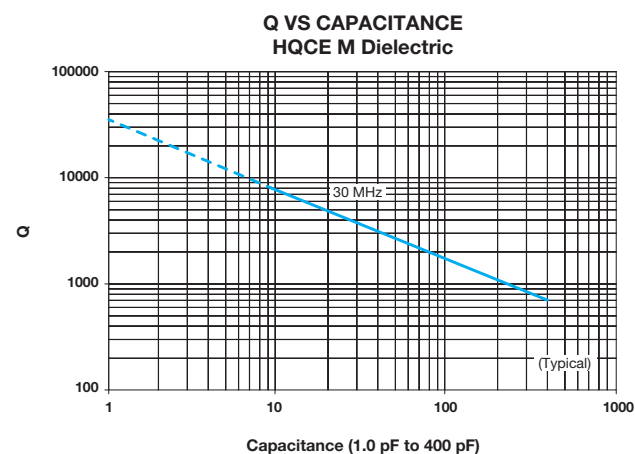
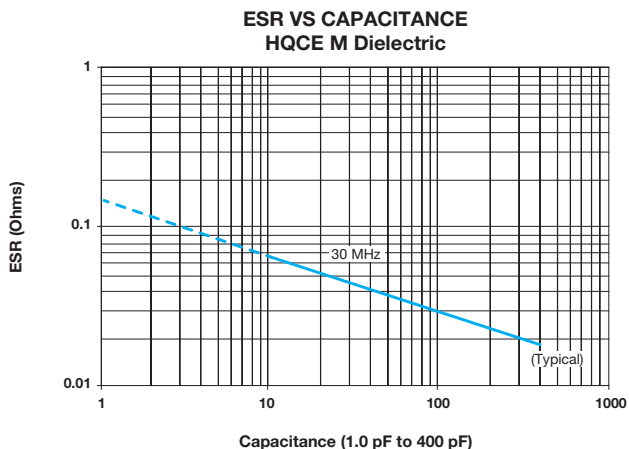


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For 600V to 7200V Applications



## HQCE PERFORMANCE CHARACTERISTICS (M DIELECTRIC)

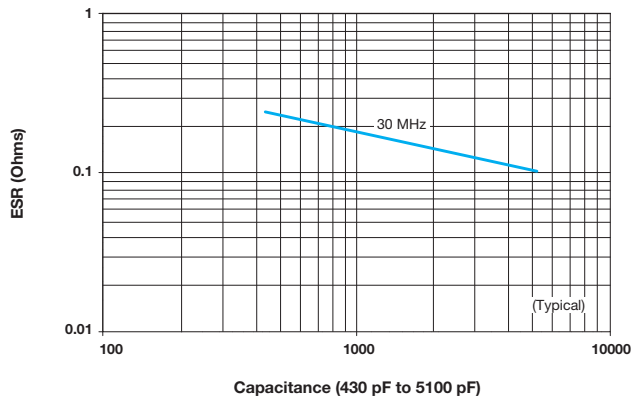


# Hi-Q® High RF Power MLC Surface Mount Capacitors

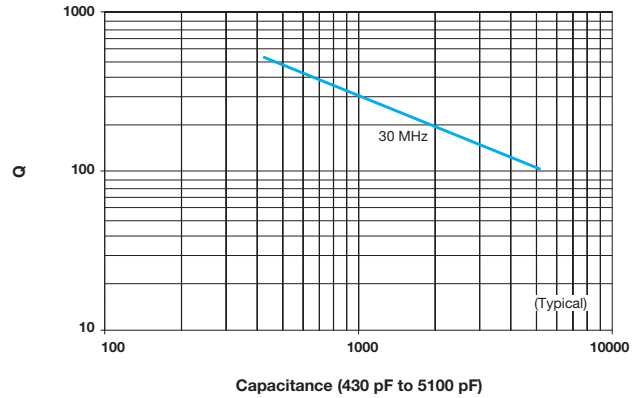
For 600V to 7200V Applications



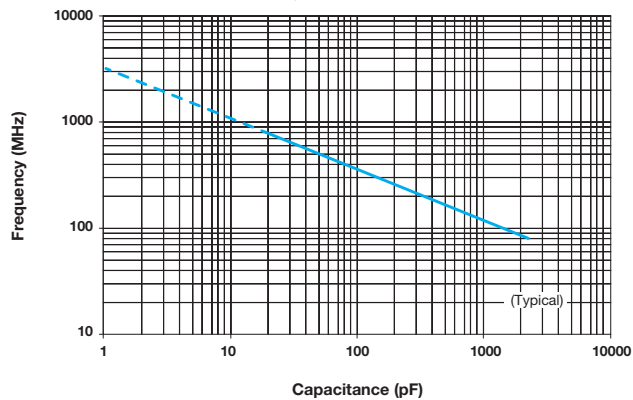
**ESR VS CAPACITANCE**  
HQCE M Dielectric



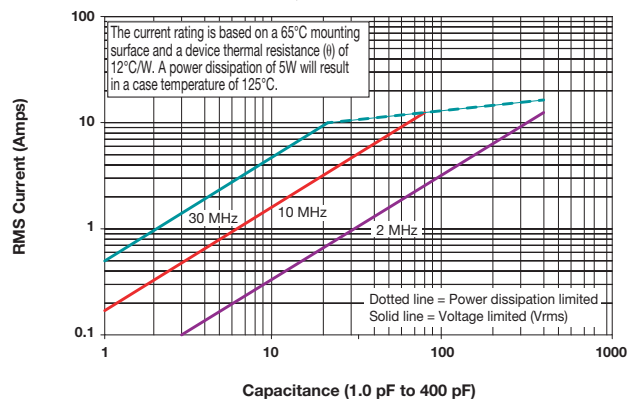
**Q VS CAPACITANCE**  
HQCE M Dielectric



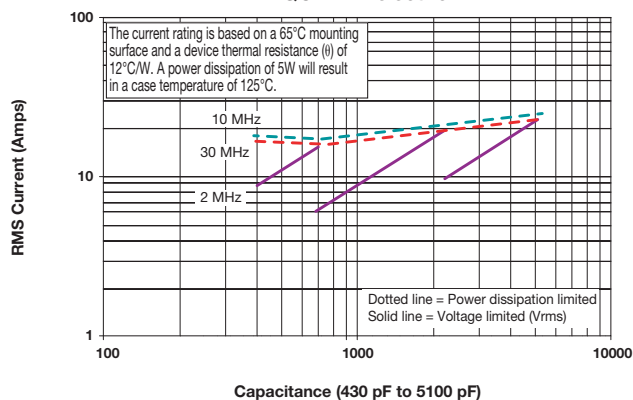
**SERIES RESONANCE VS CAPACITANCE**  
HQCE M Dielectric



**CURRENT RATING VS CAPACITANCE**  
HQCE M Dielectric



**CURRENT RATING VS CAPACITANCE**  
HQCE M Dielectric



# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## AVX:

[HQCEMA680FAT9A](#) [HQCEMA680FAT3A](#) [HQCEKA151JAT9A](#) [HQLCHA6R8CAM](#) [HQLCGA471GAM](#)  
[HQCCHA3R3DAT9A](#) [HQLCSA102GAM](#) [HQCEMA470JAT9A](#) [HQLKA111JAM](#) [HQLCAA332GAM](#)  
[HQCEMA101JAT3A](#) [HQLMA270JAM](#) [HQLCHA220DAM](#) [HQCEMA750FAT3A](#) [HQCEMA430FAT3A](#)  
[HQCEMA270FAT3A](#) [HQLCCA222GAM](#) [HQLCAA392GAM](#) [HQLCHA150DAM](#) [HQLMA101KAA](#) [HQCCHA200GA19A](#)  
[HQCCHA180GA11A](#) [HQCCHA820KA11A](#) [HQCCHA131GA11A](#) [HQCCHA200GA11A](#) [HQCCHA330GAT9A](#)  
[HQCCHA101GA11A](#) [HQCCHA120GAT9A](#) [HQCCHA121GAT9A](#) [HQCCHA150GA11A](#) [HQCCHA151JA19A](#)  
[HQCCHA220GAT1A](#) [HQCCHA220GAT9A](#) [HQCCHA221GAT9A](#) [HQCCHA271GAT9A](#) [HQCCHA330GA11A](#)  
[HQCCHA390GAT9A](#) [HQCCHA4R7CA19A](#) [HQCCHA560GAT9A](#) [HQCCHA680GAT9A](#) [HQCCHA6R8CAT1A](#)  
[HQCCSA102KAT1A](#) [HQCCSA821GAT9A](#) [HQCCWA331GAT9A](#) [HQCCWA391GAT9A](#) [HQCECA682KAT3A](#)  
[HQCEGA122JAT9A](#) [HQCEGA182KAT3A](#) [HQCEGA182KAT9A](#) [HQCEHA561JAT9A](#) [HQCEHA681JA19A](#)  
[HQCEHA681JAT9A](#) [HQCEJA221JAT9A](#) [HQCEJA391JAT9A](#) [HQCEWA821JAT9A](#) [HQLCHA470KAM](#)  
[HQLCHA560KAM](#) [HQLCHA820KAM](#) [HQCCSA122FAT1A](#) [HQCEMA180JAT6A](#) [HQCEMA101JAT6A](#)  
[HQCEMA220JAT9A](#) [HQCEMA270JAT9A](#) [HQCEMA330JAT9A](#) [HQLGA122GAM](#) [HQLHA511GAM](#)  
[HQCC7M152GAH6A](#) [HQCC7M182GAH6A](#) [HQCC9M222GAH6A](#) [HQCC9M272GAH6A](#) [HQCCAM102GAH6A](#)  
[HQCCAM122GAH6A](#) [HQCCAM561GAH6A](#) [HQCCAM681GAH6A](#) [HQCCAM821GAH6A](#) [HQCCSM361GAH6A](#)  
[HQCCSM471GAH6A](#) [HQCCWM100GAH6A](#) [HQCCWM101GAH6A](#) [HQCCWM120GAH6A](#) [HQCCWM121GAH6A](#)  
[HQCCWM150GAH6A](#) [HQCCWM151GAH6A](#) [HQCCWM180GAH6A](#) [HQCCWM181GAH6A](#) [HQCCWM200GAH6A](#)  
[HQCCWM221GAH6A](#) [HQCCWM240GAH6A](#) [HQCCWM271GAH6A](#) [HQCCWM2R0BAH6A](#) [HQCCWM2R4BAH6A](#)  
[HQCCWM300GAH6A](#) [HQCCWM330GAH6A](#) [HQCCWM3R3BAH6A](#) [HQCCWM3R9BAH6A](#) [HQCCWM430GAH6A](#)  
[HQCCWM470GAH6A](#) [HQCCWM4R7BAH6A](#) [HQCCWM510GAH6A](#) [HQCCWM560GAH6A](#)