RF/Microwave Multilayer Capacitors (MLC)

HQ® Series, High RF Power Capacitors

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.

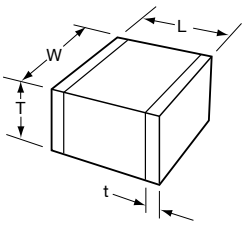
HOW TO ORDER

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

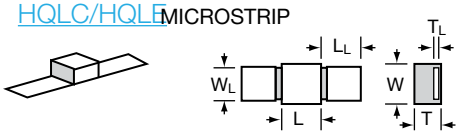
**Note: HQLC/HQLE are only available with leaded termination styles. All capacitance values by size/dielectric still apply.

DIMENSIONS

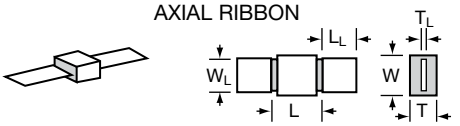
HQCC/HQCE



HQLC/HQLE MICROSTRIP



AXIAL RIBBON



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

mm (inches)

STYLE	HQCC	HQCE
(L) Length	6.22 ± 0.64 (0.245 ± 0.025)	9.65 +0.89 -0.25 (0.380 +0.035 -0.010)
(W) Width	6.35 ± 0.38 (0.250 ±0.015)	9.65 ± 0.25 (0.380 ± 0.010)
(T) Thickness Max.	3.68 (0.145) max. for capacitance values ≤ 680pF	4.32 (0.170) max.
	4.19 (0.165) max. for capacitance values ≤ 680pF	
(L_L) Lead Length	12.7 min. (0.500)	19.05 (0.750)
(W_L) Lead Width	6.10 ± 0.127 (0.240 ± 0.005)	8.89 ± 0.25 (0.350 ±0.010)
(T_L) Lead Thickness	0.102 ±0.025 (0.004 ± 0.001)	0.25 ± 0.13 (0.010 ±0.005)
Lead Material	High Purity Silver Leads Leads are attached with High Temperature Solder	High Purity Silver Leads Leads are attached with High Temperature Solder

mm (inches)

Not RoHS Compliant

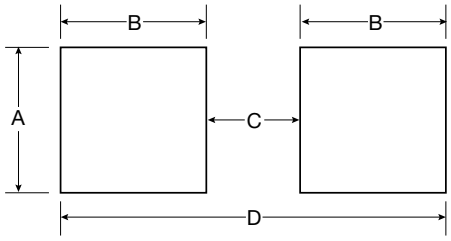
LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

For RoHS compliant products, please select correct termination style.

MOUNTING DIMENSIONS



HQCC

mm (inches)

Mounting Orientation	Layout Type	A min.	B min.	C min.	D min.
Horizontal	Normal	7.112 (0.280)	1.270 (0.050)	5.080 (0.200)	7.620 (0.300)
	High Density	6.604 (0.260)	0.762 (0.030)	5.080 (0.200)	6.604 (0.260)
Vertical (<680pF)	Normal	3.810 (0.150)	1.270 (0.050)	5.080 (0.200)	7.620 (0.300)
	High Density	3.302 (0.130)	0.762 (0.030)	5.080 (0.200)	6.604 (0.260)
Vertical (>680pF)	Normal	4.699 (0.185)	1.270 (0.050)	5.080 (0.200)	7.620 (0.300)
	High Density	4.191 (0.165)	0.762 (0.030)	5.080 (0.200)	6.604 (0.260)

HQCE

mm (inches)

Mounting Orientation	Layout Type	A min.	B min.	C min.	D min.
Horizontal	Normal	10.287 (0.405)	1.270 (0.050)	8.255 (0.325)	10.795 (0.425)
	High Density	9.779 (0.385)	0.762 (0.030)	8.255 (0.325)	9.779 (0.385)
Vertical	Normal	4.699 (0.185)	1.270 (0.050)	8.255 (0.325)	10.795 (0.425)
	High Density	4.191 (0.165)	0.762 (0.030)	8.255 (0.325)	9.779 (0.385)

DIELECTRIC PERFORMANCE CHARACTERISTICS

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

HQCC/HQLC CAPACITANCE VALUES (A DIELECTRIC)

Cap Code	Cap (pF)	Tol.	Rated WVDC
1R0	1.0	B, C, D	2500
1R2	1.2		
1R5	1.5		
1R8	1.8		
2R2	2.2		
2R7	2.7		
3R3	3.3		
3R9	3.9		
4R7	4.7		
5R6	5.6		
6R8	6.8		

Cap Code	Cap (pF)	Tol.	Rated WVDC
8R2	8.2	B, C, D	2500
100	10	F, G, J K, M	
120	12		
150	15		
180	18		
220	22		
270	27		
330	33		
390	39		
470	47		
560	56		

Cap Code	Cap (pF)	Tol.	Rated WVDC
680	68	F, G, J K, M	2500
820	82		
101	100		
121	120		
151	150		
181	180		
221	220		
271	270		
331	330		1500
391	390		

Cap Code	Cap (pF)	Tol.	Rated WVDC
471	470	F, G, J K, M	1500
561	560		1000
681	680		
821	820		
102	1000		
122	1200		
152	1500		500
182	1800		
222	2200		300
272	2700		

HQCC/HQLC CAPACITANCE VALUES (M DIELECTRIC)

Cap Code	Cap (pF)	Tol.	Rated WVDC	
			Standard	Extended
1R0	1.0	B, C, D	2500	3600
1R1	1.1			
1R2	1.2			
1R3	1.3			
1R4	1.4			
1R5	1.5			
1R6	1.6			
1R7	1.7			
1R8	1.8			
1R9	1.9			
2R0	2.0			
2R1	2.1			
2R2	2.2			
2R4	2.4			
2R5	2.5			
3R0	3.0			
3R3	3.3			
3R6	3.6			
3R9	3.9			
4R3	4.3			
4R7	4.7			
5R1	5.1			
5R6	5.6			
6R2	6.2			
6R8	6.8			
7R5	7.5			
8R2	8.2			
9R1	9.1			

Cap Code	Cap (pF)	Tol.	Rated WVDC	
			Standard	Extended
100	10	F, G, J K, M	2500	3600
110	11			
120	12			
130	13			
150	15			
160	16			
180	18			
200	20			
220	22			
240	24			
270	27			
300	30			
330	33			
360	36			
390	39			
430	43			
470	47			
510	51			
560	56			
620	62			
680	68			
750	75			
820	82			
910	91			
101	100			
111	110			3000
121	120			
131	130			
151	150			

Cap Code	Cap (pF)	Tol.	Rated WVDC	
			Standard	Extended
161	160	F, G, J K, M	2500	3000
181	180			
201	200			
221	220			
241	240			
271	270			
301	300		1500	2000
331	330			
331	330			
361	360			
391	390			
431	430			
471	470			
511	510		1000	1500
561	560			
621	620			
681	680			
751	750			
821	820			
911	910			
102	1000			
112	1100			
122	1200			
152	1500		500	800
182	1800			
222	2200		300	500
242	2400			
272	2700			

HQCE/HQLE CAPACITANCE VALUES (A DIELECTRIC)

Cap Code	Cap (pF)	Tol.	Rated WVDC	
			Standard	Extended
1R0	1.0	C, D	3600	7200
1R2	1.2			
1R5	1.5			
1R8	1.8			
2R2	2.2			
2R7	2.7			
3R3	3.3			
3R9	3.9			
4R7	4.7			
5R6	5.6			
6R8	6.8			
8R2	8.2			
100	10	G, J, K, M		
120	12			

Cap Code	Cap (pF)	Tol.	Rated WVDC	
			Standard	Extended
150	15	G, J, K, M	3600	7200
180	18			
220	22			
270	27			
330	33			
390	39			
470	47			
560	56			
680	68			
820	82			
101	100			
121	120			5000
151	150			
181	180			

Cap Code	Cap (pF)	Tol.	Rated WVDC	
			Standard	Extended
221	220	G, J, K, M	3600	NA
271	270			
331	330			
391	390			
471	470		2500	
561	560			
681	680			
821	820		1000	
102	1000			
122	1200			
152	1500			
182	1800			
222	2200			

HQCE/HQLE CAPACITANCE VALUES (M DIELECTRIC)

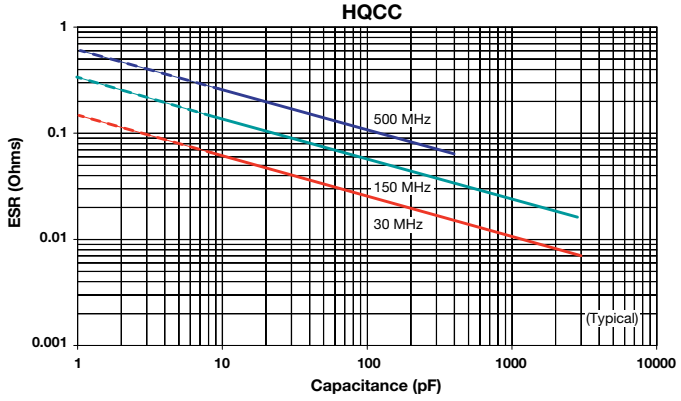
Cap Code	Cap (pF)	Tol.	Rated WVDC	
			Standard	Extended
1R0	1.0	B, C, D	3600	7200
1R2	1.2			
1R5	1.5			
1R8	1.8			
2R2	2.2			
2R7	2.7			
3R3	3.3			
3R9	3.9			
4R7	4.7			
5R6	5.6			
6R8	6.8			
8R2	8.2			
100	10	F, G, J, K, M		
120	12			
150	15			

Cap Code	Cap (pF)	Tol.	Rated WVDC	
			Standard	Extended
180	18	F, G, J, K, M	3600	7200
220	22			
270	27			
330	33			
390	39			
470	47			
560	56			
680	68			
820	82			
101	100			
121	120			5000
151	150			
181	180			
221	220			3600
271	270			

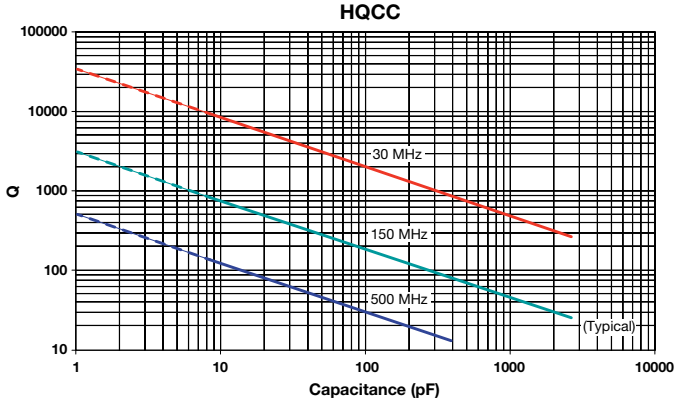
Cap Code	Cap (pF)	Tol.	Rated WVDC	
			Standard	Extended
331	330	F, G, J, K, M	3600	NA
391	390			
471	470		2500	
561	560			
681	680			
821	820		1000	
102	1000			
122	1200			
152	1500			
182	1800			
222	2200			
272	2700	G, J K, M	500	
332	3300			
472	4700			
512	5100			

HQCC PERFORMANCE CHARACTERISTICS (A DIELECTRIC)

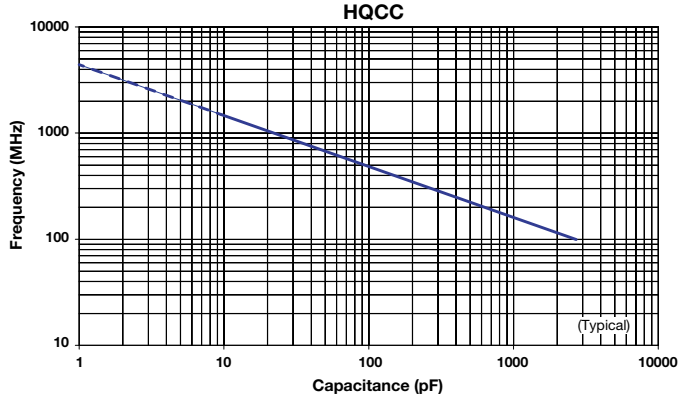
ESR VS. CAPACITANCE
HQCC



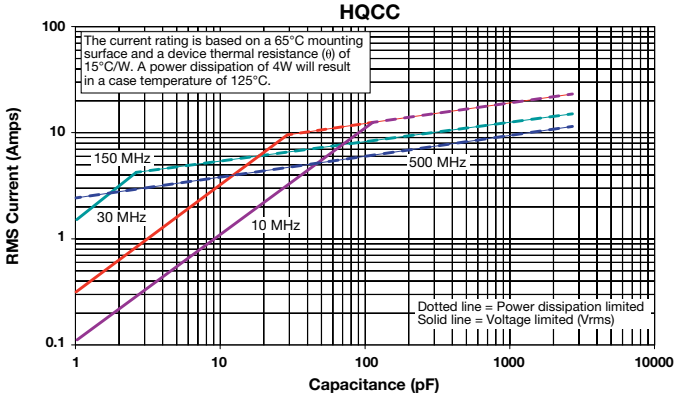
Q VS. CAPACITANCE
HQCC



SERIES RESONANCE VS. CAPACITANCE
HQCC

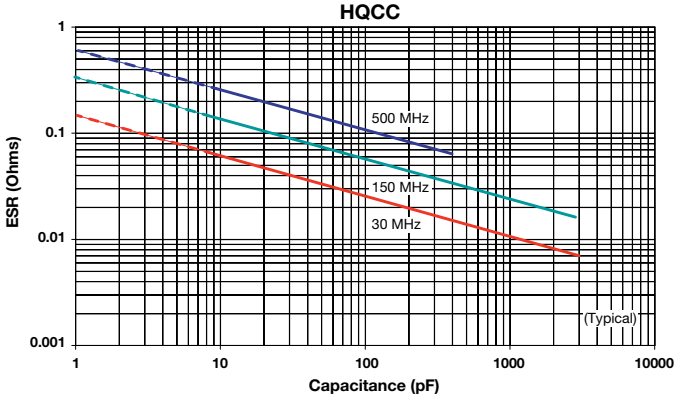


CURRENT RATING VS. CAPACITANCE
HQCC

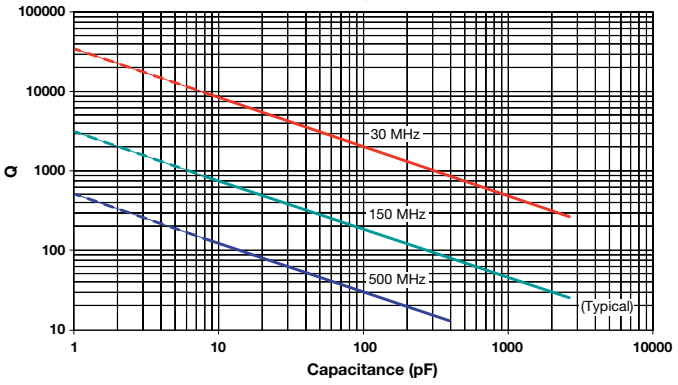


HQCC PERFORMANCE CHARACTERISTICS (M DIELECTRIC)

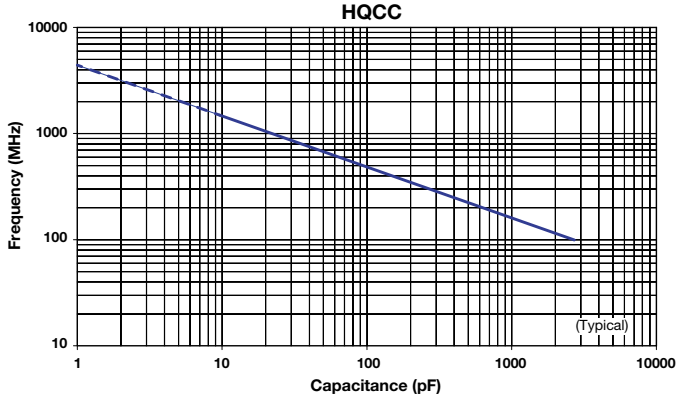
ESR VS. CAPACITANCE
HQCC



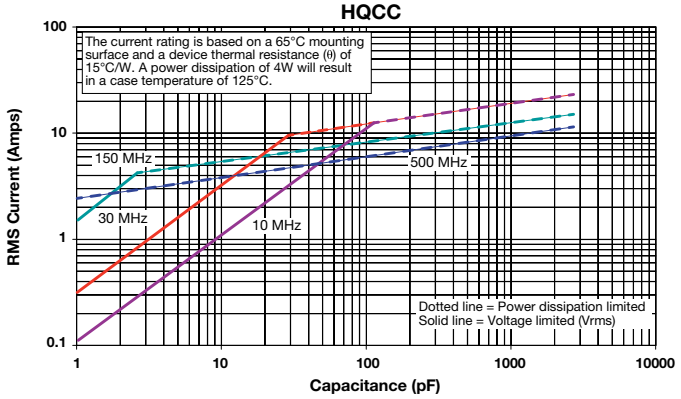
Q VS. CAPACITANCE
HQCC



SERIES RESONANCE VS. CAPACITANCE HQCC

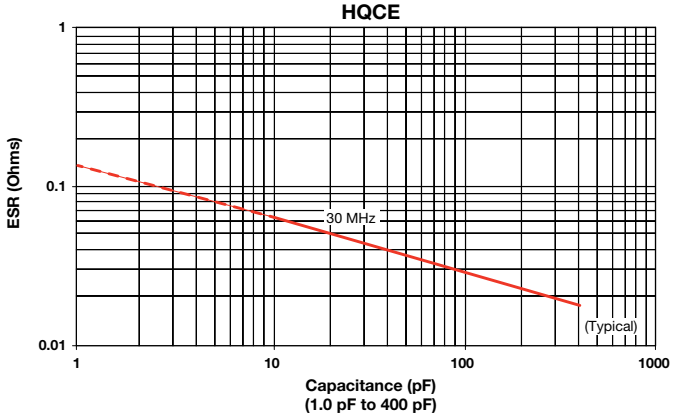


CURRENT RATING VS. CAPACITANCE HQCC

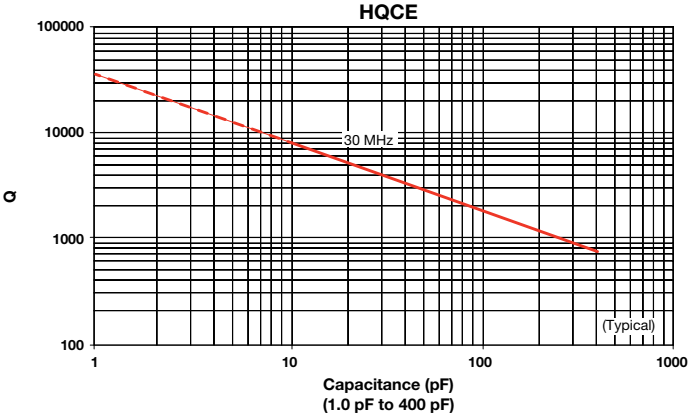


HQCE PERFORMANCE CHARACTERISTICS (A DIELECTRIC)

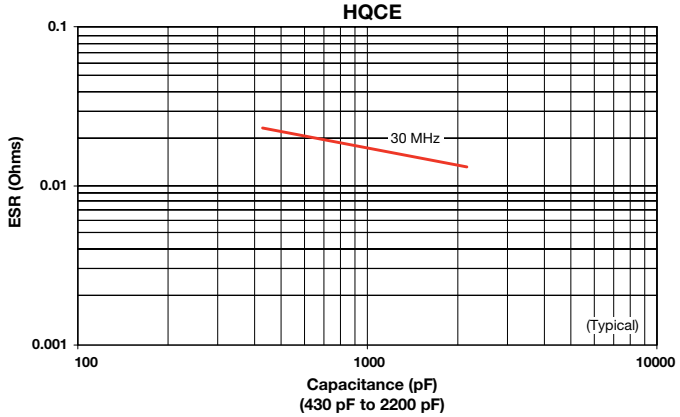
ESR VS. CAPACITANCE HQCE



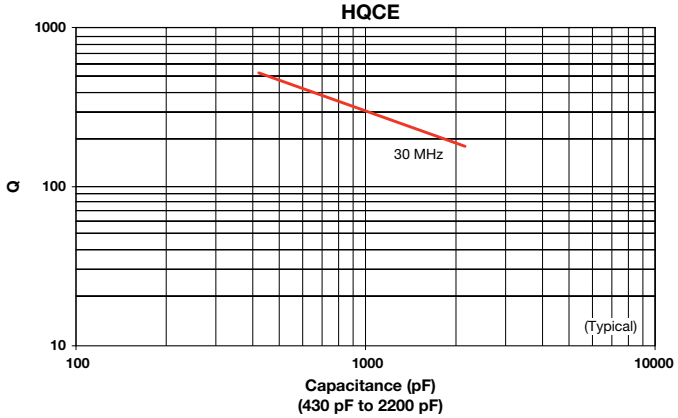
Q VS. CAPACITANCE HQCE



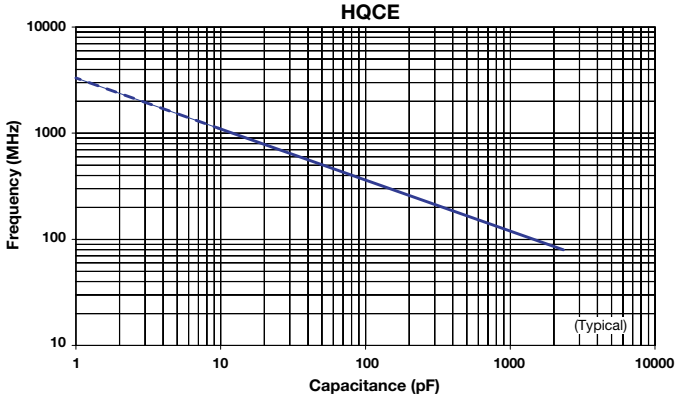
ESR VS. CAPACITANCE HQCE



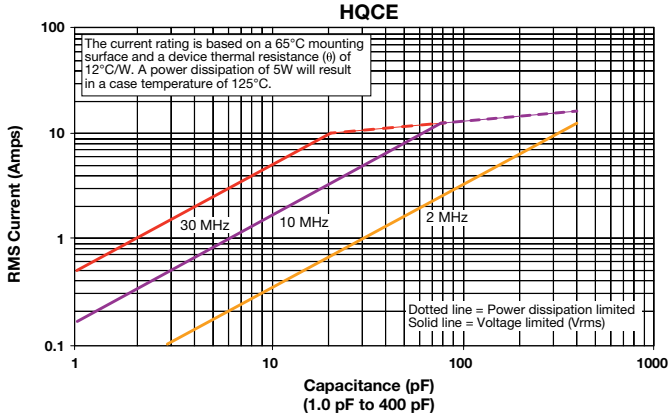
Q VS. CAPACITANCE HQCE



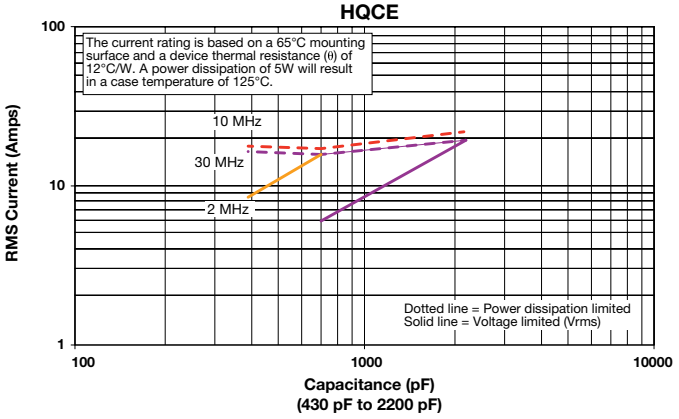
SERIES RESONANCE VS. CAPACITANCE
HQCE



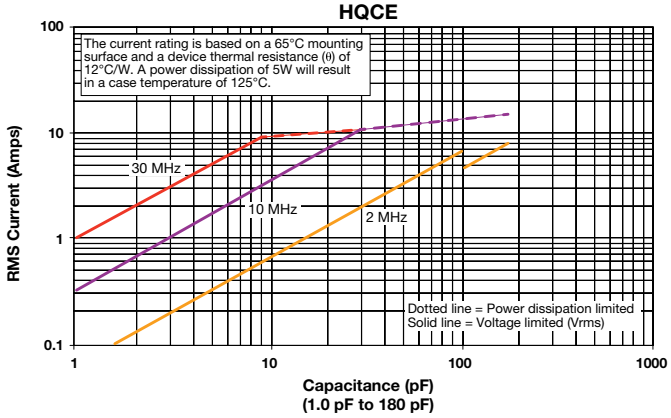
CURRENT RATING VS. CAPACITANCE
HQCE



CURRENT RATING VS. CAPACITANCE
HQCE

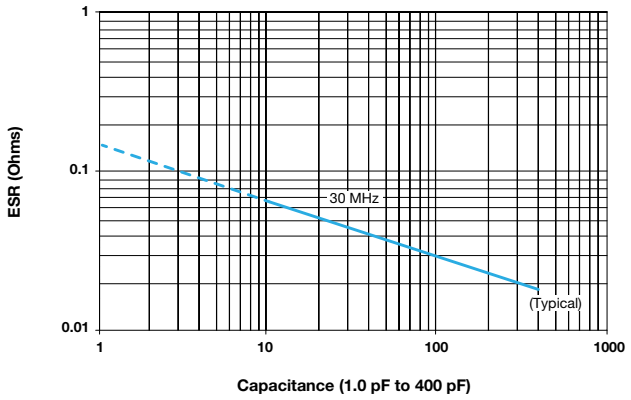


CURRENT RATING VS. CAPACITANCE
HQCE

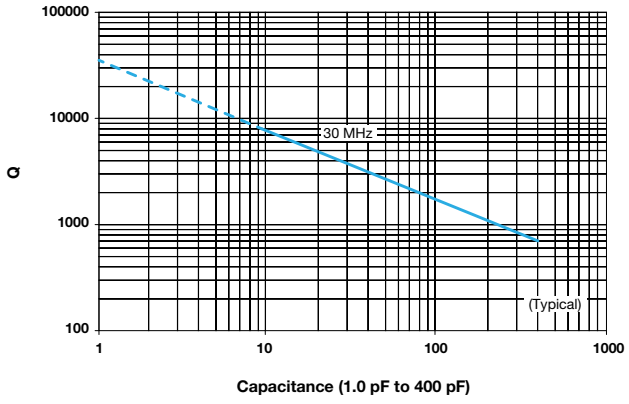


HQCE PERFORMANCE CHARACTERISTICS (M DIELECTRIC)

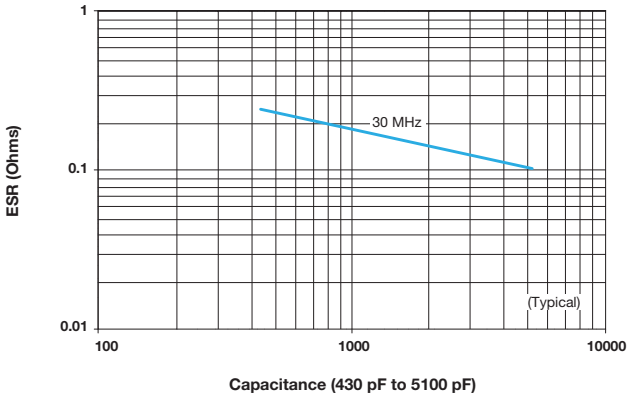
ESR VS CAPACITANCE
HQCE M Dielectric



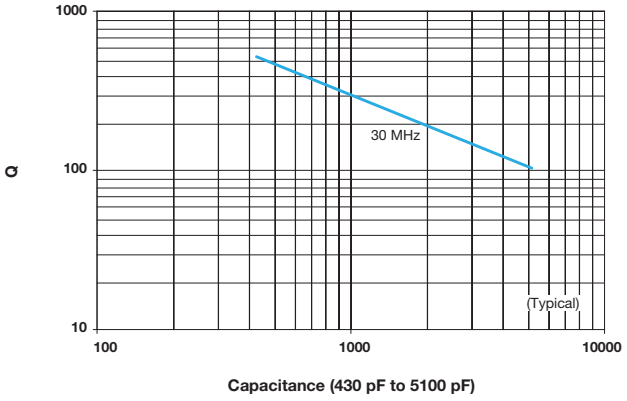
Q VS CAPACITANCE
HQCE M Dielectric



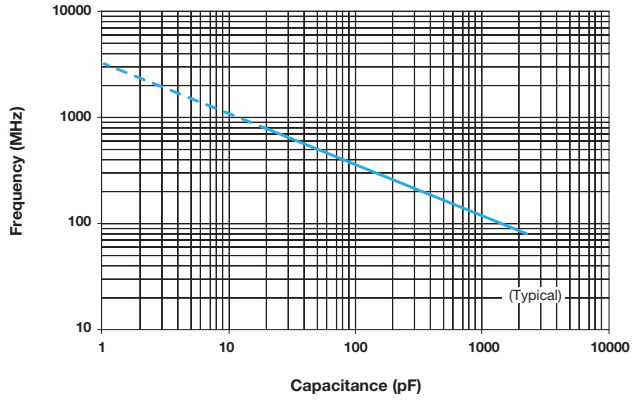
ESR VS CAPACITANCE
HQCE M Dielectric



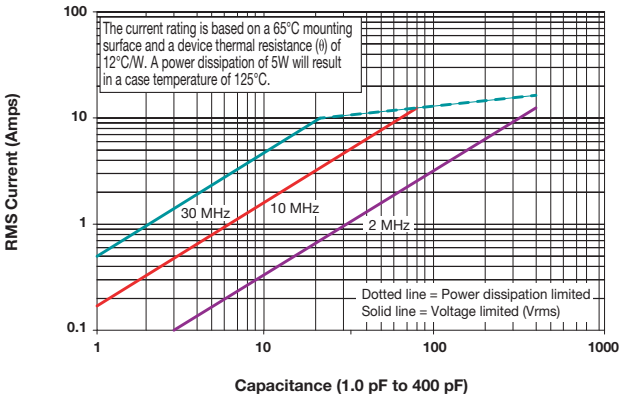
Q VS CAPACITANCE
HQCE M Dielectric



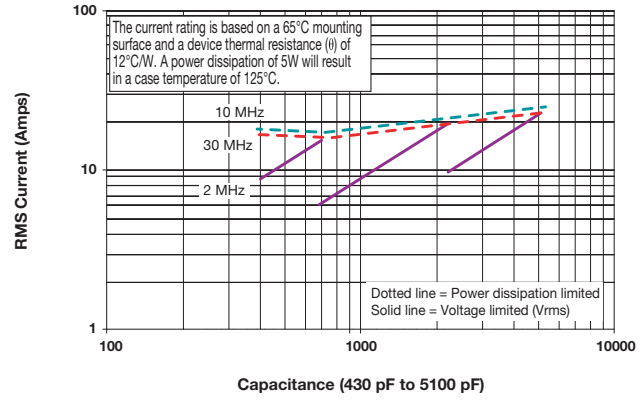
SERIES RESONANCE VS CAPACITANCE
HQCE M Dielectric



CURRENT RATING VS CAPACITANCE
HQCE M Dielectric



CURRENT RATING VS CAPACITANCE
HQCE M Dielectric



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

AVX:

HQCEMA680FAT9A HQCEMA680FAT3A HQCEKA151JAT9A HQLCHA6R8CAM HQLCGA471GAM HQCCHA3R3DAT9A HQLCSA102GAM HQCEMA470JAT9A HQLEKA111JAM HQLEAA332GAM HQCEMA101JAT3A HQLEMA270JAM HQLCHA220DAM HQCEMA750FAT3A HQCEMA430FAT3A HQCEMA270FAT3A HQLCCA222GAM HQLEAA392GAM HQLCHA150DAM HQLEMA101KAA 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 HQLEGA122GAM HQLEHA511GAM 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