

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

AVX Style
 HQCC
 HQCE
 HQLC**
 HQLC**
 HQLC**

A

Voltage
 300V = 9
 500V = 7
 800V = U
 1000V = A
 1500V = S
 2500V = W
 3000V = H
 3600V = J
 5000V = K
 7200V = M

A

Temperature Coefficient
 COG = A
 P90 = M

271

Capacitance Code
 (2 significant digits + no. of zeros)
 Examples:
 4.7 pF = 4R7
 10 pF = 100
 100 pF = 101
 1,000 pF = 102

J

Capacitance Tolerance
 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

Test Level
 A = Standard

T

Termination
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)

1A

Packaging
 1A = 7" Reel*
 6A = Waffle Pack
 *HQCC & HQCE only

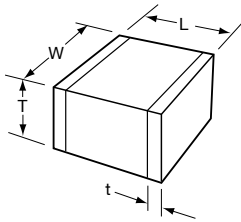
Leaded Termination (HQLC/HQLE)

A = Axial Ribbon
 M = Microstrip
 4 = Axial Ribbon (Non-Magnetic)
 5 = Microstrip (Non-Magnetic)

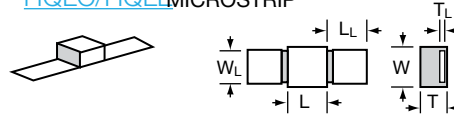
**Note: HQLC/HQLE are only available with leaded termination styles. All capacitance values by size/dielectric still apply.

DIMENSIONS

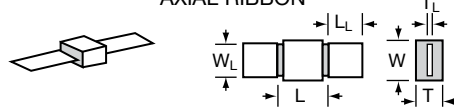
HQCC/HQCE



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 4.19 (0.165) max. for capacitance values > 680pF	4.32 (0.170) max.
(t) Overlap	1.02 (0.040) max.	1.02 (0.040) max.

mm (inches)

Not RoHS Compliant



For RoHS compliant products,
 please select correct termination style.

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 4.19 (0.165) max. for capacitance values ≤ 680pF	4.32 (0.170) max.
(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)

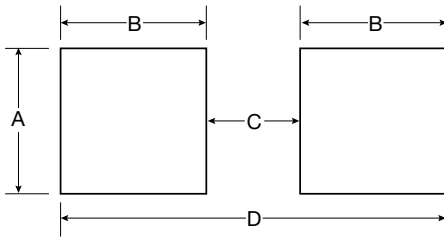


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MOUNTING DIMENSIONS



HQCC		mm (inches)				HQCE		mm (inches)			
Mounting Orientation	Layout Type	A min.	B min.	C min.	D min.	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)	Horizontal	Normal	10.287 (0.405)	1.270 (0.050)	8.255 (0.325)	10.795 (0.425)
	High Density	6.604 (0.260)	0.762 (0.030)	5.080 (0.200)	6.604 (0.260)		High Density	9.779 (0.385)	0.762 (0.030)	8.255 (0.325)	9.779 (0.385)
Vertical (<680pF)	Normal	3.810 (0.150)	1.270 (0.050)	5.080 (0.200)	7.620 (0.300)	Vertical	Normal	4.699 (0.185)	1.270 (0.050)	8.255 (0.325)	10.795 (0.425)
	High Density	3.302 (0.130)	0.762 (0.030)	5.080 (0.200)	6.604 (0.260)		High Density	4.191 (0.165)	0.762 (0.030)	8.255 (0.325)	9.779 (0.385)
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)						

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.

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HQCC/HQLC 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 K, M	2500	471	470	F, G, J K, M	1500							
1R2	1.2			100	10	820		82	561			560	1000									
1R5	1.5			120	12	101		100	681			680	500									
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			B, C, D	2500	270		27	F, G, J K, M			2500	221		220	F, G, J K, M	2500	152	1500	F, G, J K, M	500	
3R9	3.9					330		33					271		270			182	1800			
4R7	4.7					390		39					331		330			222	2200			300
5R6	5.6					470		47					391		390			272	2700			
6R8	6.8					560	56															

HQCC/HQLC 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 K, M	2500	3600	161	160	F, G, J, K, M	2500	3000		
1R1	1.1				110	11				181	180					
1R2	1.2				120	12				201	200				1500	2000
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					
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											
5R1	5.1	750	75	112	1100											
5R6	5.6	820	82	122	1200											
6R2	6.2	910	91	152	1500	500	800									
6R8	6.8	101	100	182	1800											
7R5	7.5	111	110	222	2200	300	500									
8R2	8.2	121	120	242	2400											
9R1	9.1	131	130	272	2700											
		151	150													

HQCE/HQLE 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				2500
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		1000		
5R6	5.6				820	82				122	1200				
6R8	6.8				101	100				152	1500				
8R2	8.2				121	120				182	1800				
100	10	151	150	222	2200										
120	12	181	180												

HQCE/HQLE CAPACITANCE VALUES (M DIELECTRIC)

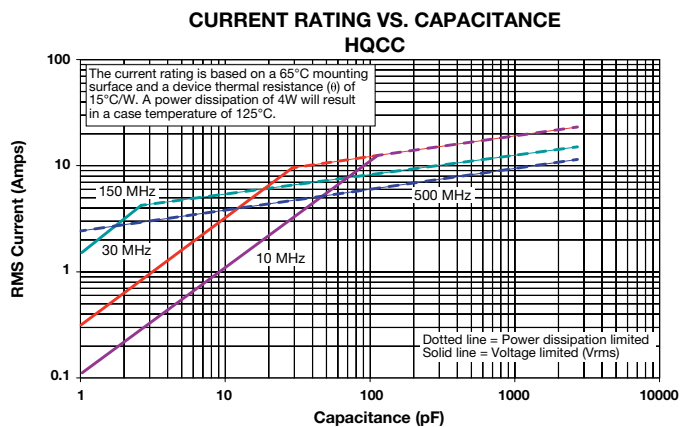
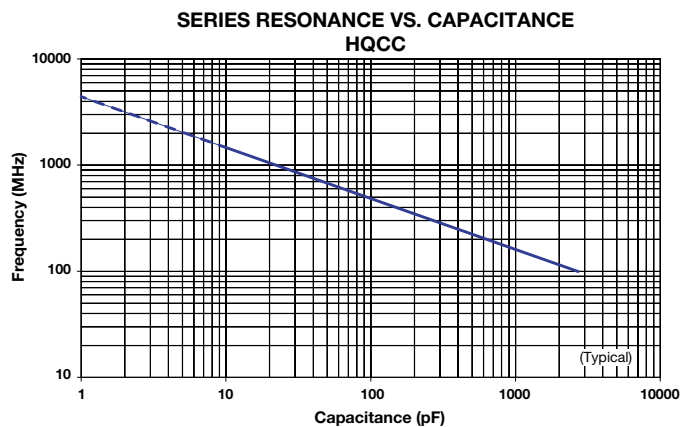
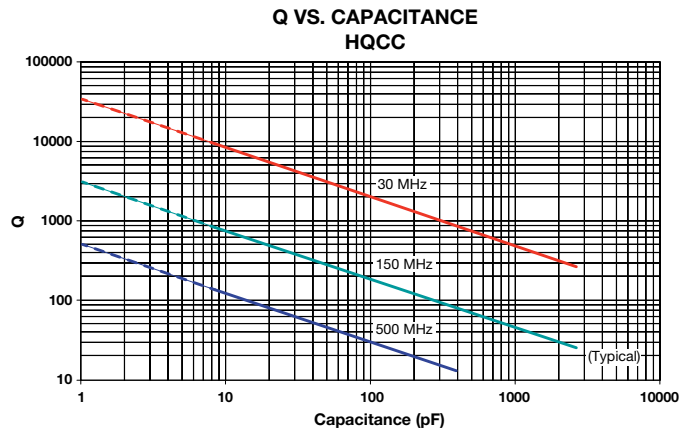
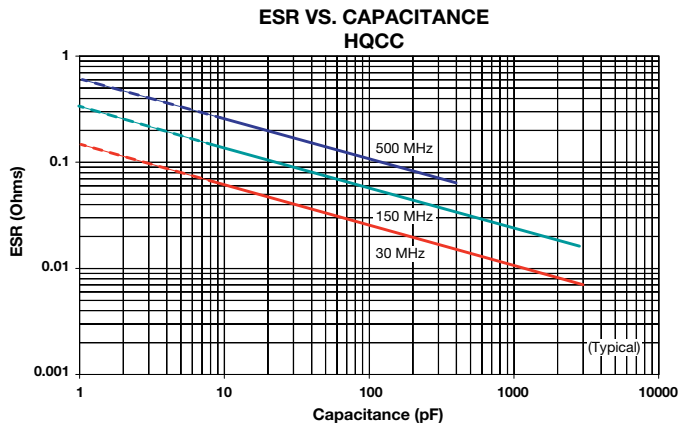
Cap Code	Cap (pF)	Tol.	Rated WVDC		Cap Code	Cap (pF)	Tol.	Rated WVDC		Cap Code	Cap (pF)	Tol.	Rated WVDC		
			Standard	Extended				Standard	Extended				Standard	Extended	
1R0	1.0	B, C, D	3600	7200	180	18	F, G, J, K, M	3600	7200	331	330	F, G, J, K, M	3600	NA	
1R2	1.2				220	22				391	390				
1R5	1.5		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

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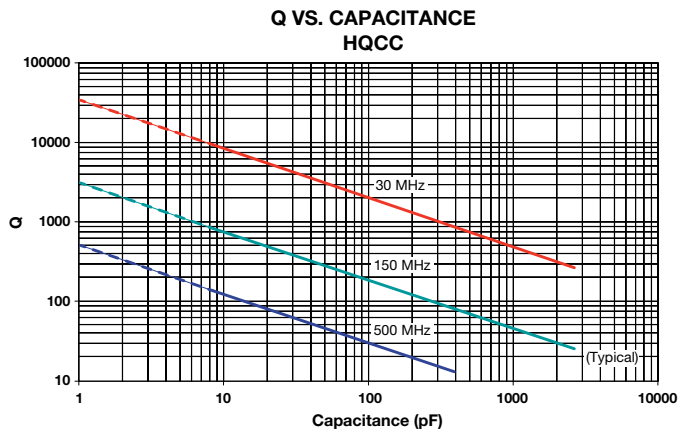
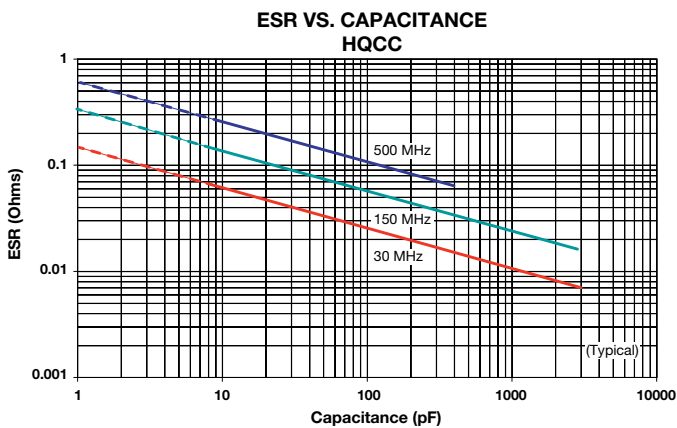


HQ[®] Series, High RF Power Capacitors

HQCC PERFORMANCE CHARACTERISTICS (A DIELECTRIC)



HQCC PERFORMANCE CHARACTERISTICS (M DIELECTRIC)



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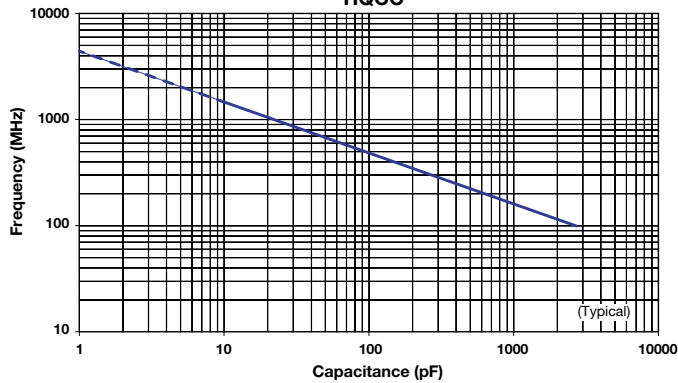
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RF/Microwave Multilayer Capacitors (MLC)

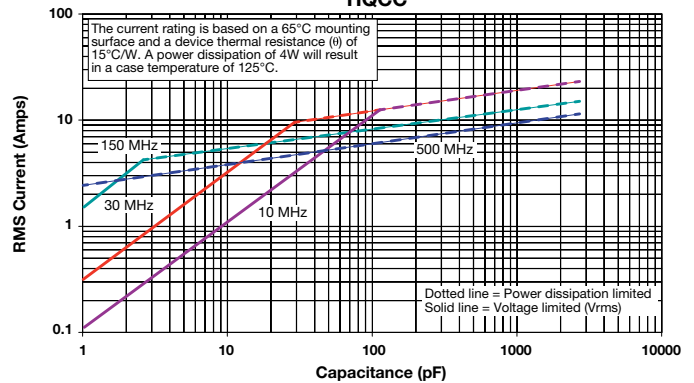


HQ[®] Series, High RF Power Capacitors

SERIES RESONANCE VS. CAPACITANCE
HQCC

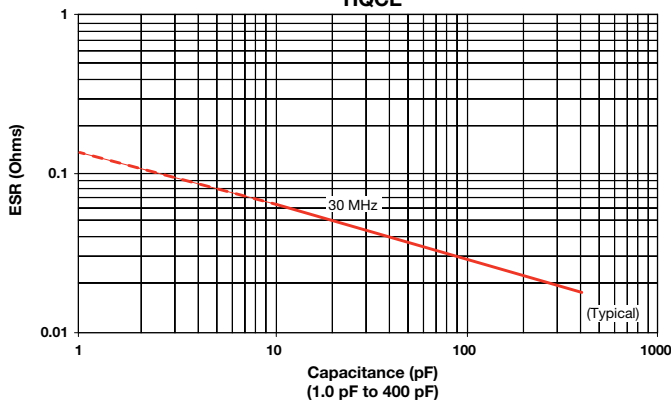


CURRENT RATING VS. CAPACITANCE
HQCC

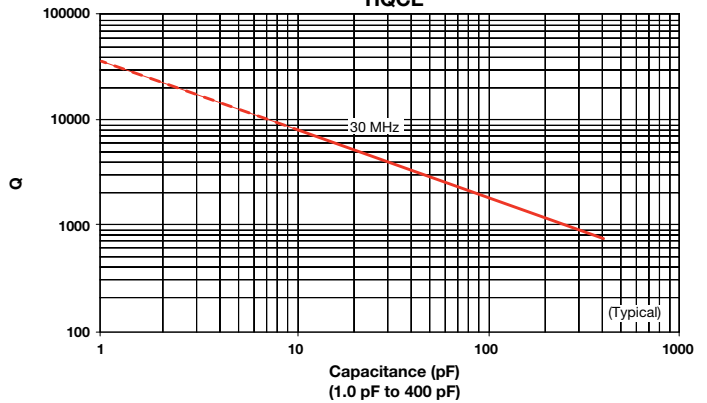


HQCE PERFORMANCE CHARACTERISTICS (A DIELECTRIC)

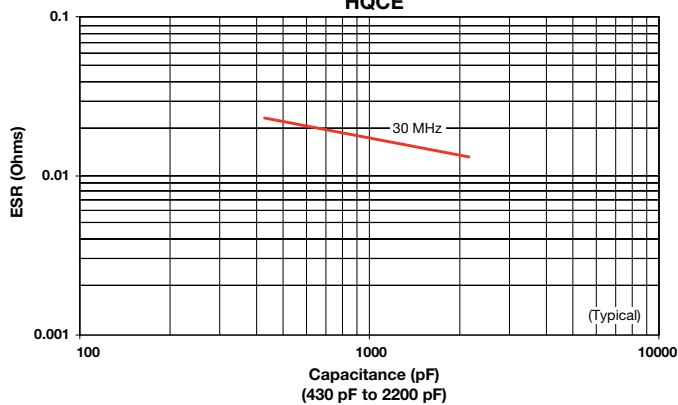
ESR VS. CAPACITANCE
HQCE



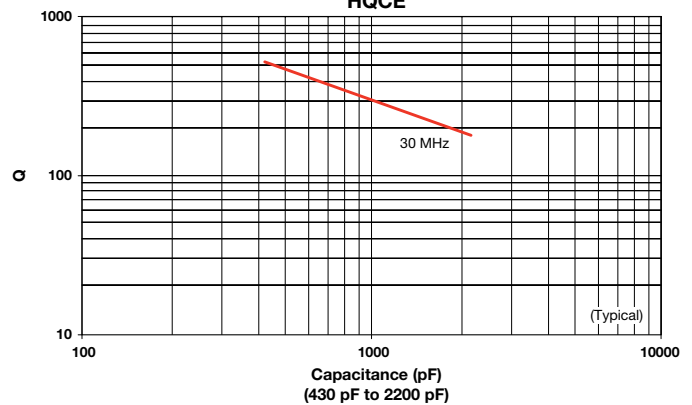
Q VS. CAPACITANCE
HQCE



ESR VS. CAPACITANCE
HQCE

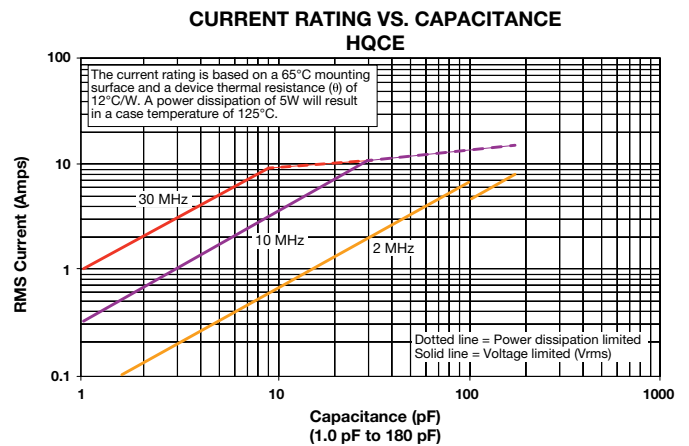
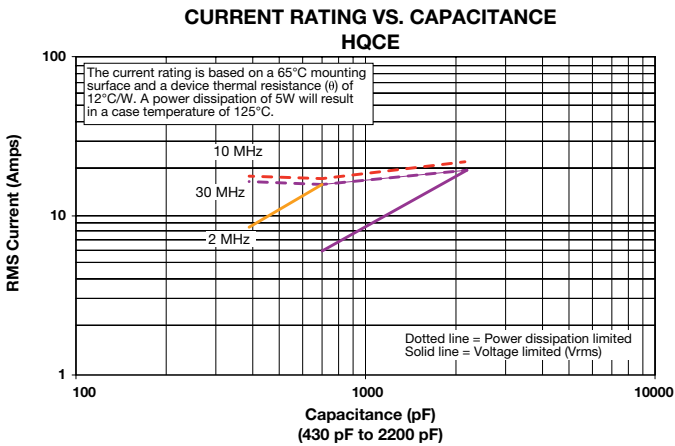
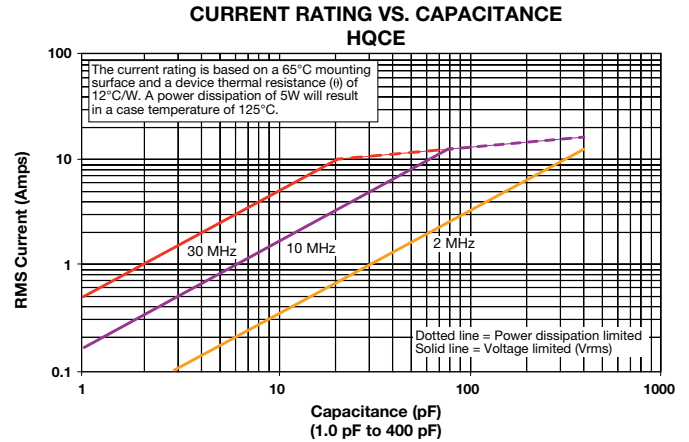
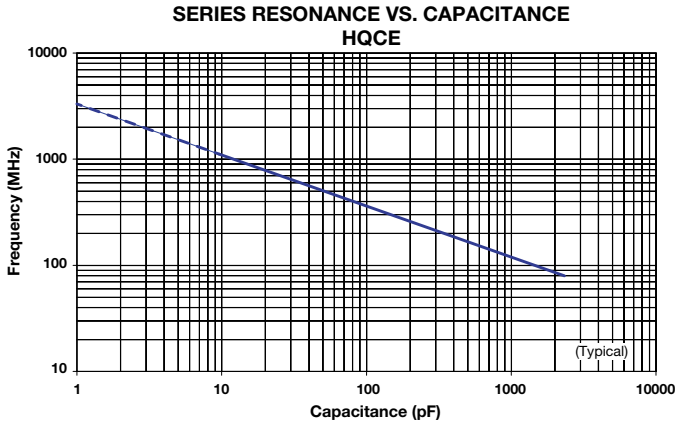


Q VS. CAPACITANCE
HQCE

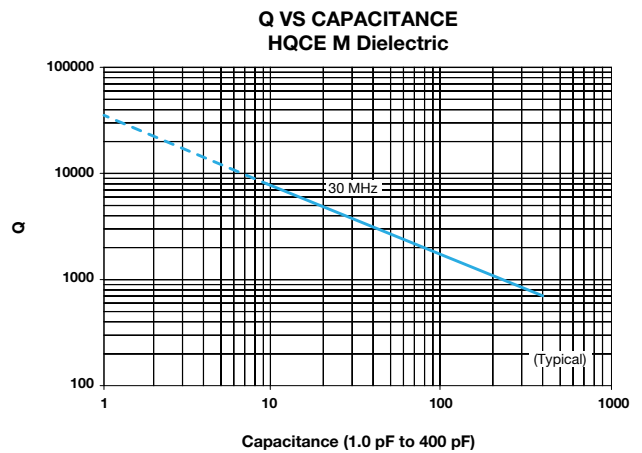
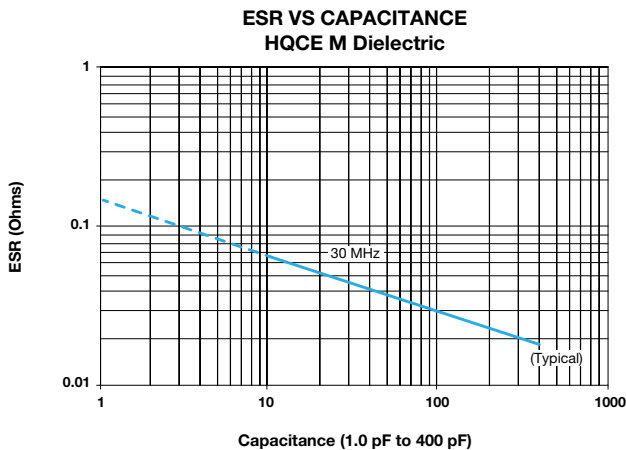


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HQCE PERFORMANCE CHARACTERISTICS (M DIELECTRIC)



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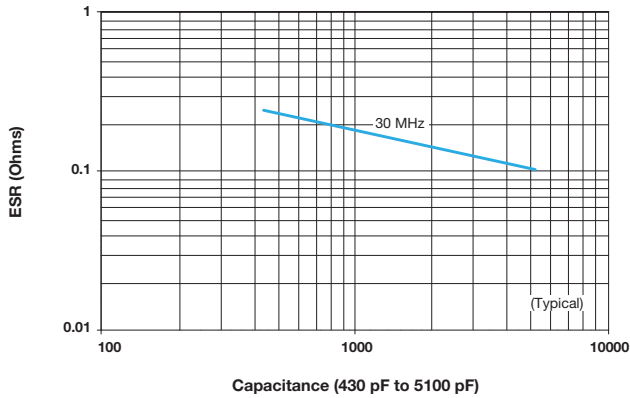
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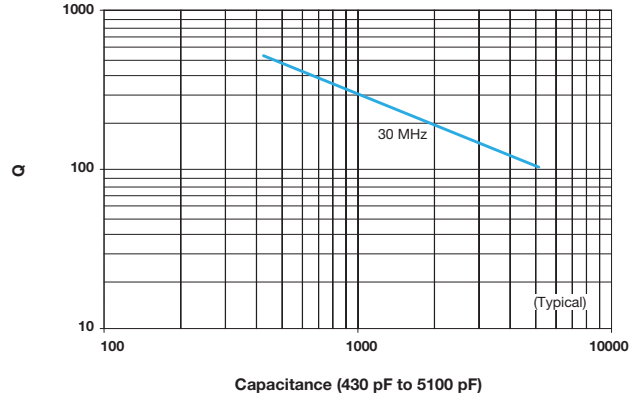
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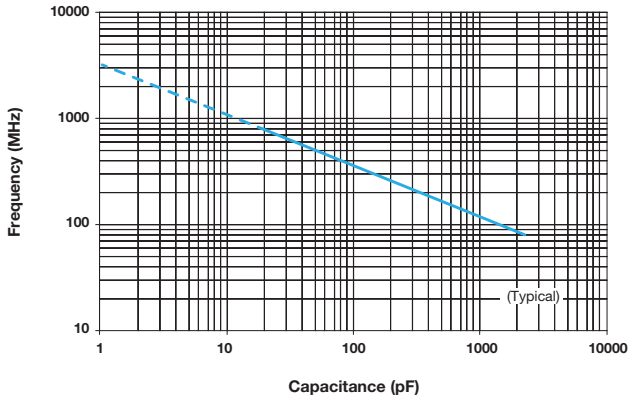
ESR VS CAPACITANCE
HQCE M Dielectric



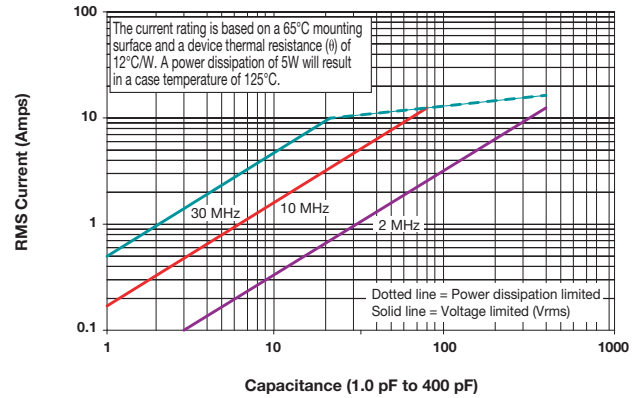
Q VS CAPACITANCE
HQCE M Dielectric



SERIES RESONANCE VS CAPACITANCE
HQCE M Dielectric



CURRENT RATING VS CAPACITANCE
HQCE M Dielectric



CURRENT RATING VS CAPACITANCE
HQCE M Dielectric

