PRODUCT CODE SYSTEM

The part number, comprising 14 digits, is formed as follows:

1	2	3	4	5	6	7	8	9	10	11	12	13	14
L	D	E	-	-	-	-	-	-	-	-	-	-	-

Digit 1 to 3 Series code (L = leadless; DE = polyester family)
Digit 4 d.c. or a.c. rated voltage (V_R).
C = 50Vdc D = 63Vdc E =100Vdc
I = 250Vdc M = 400Vdc P =630Vdc
Digit 5 Size code:

12.06	12.10	18.12	22.20	28.24	40.30	50.40	60.54
A	B	C	D	E	F	G	H

Digits 6 to 9 Digits 7 - 8 - 9 indicate the first three digits of Capacitance value and the 6th digit indicates the number of zeros that must be added to obtain the Rated Capacitance in pF.
Digit 10 Capacitance tolerance: ±5% (J); ±10% (K); ±20% (M)
Digit 11 Dielectric (A = PEN; B = PET H.T.)
Digit 12 Version (0 = miniature; 5 = standard; A to Z = special)
Digit 13 Packing (Loose = M; Tape = N; A to Z = special)
Digit 14 Internal use.

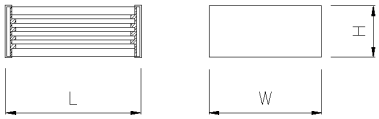
Code example:

1	2	3	4	5	6	7	8	9	10	11	12	13	14
L	D	E	C	D	3	4	7	0	J	A	5	N	-

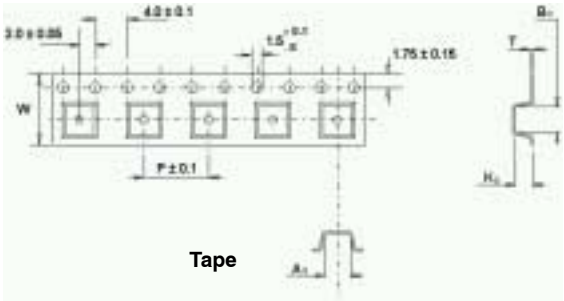
Series
Rated voltage (C = 50Vdc)
Size code (D = 22.20)
Capacitance = 0.47µF
Tolerance (J = ±5%)
Dielectric (A = PEN)
Version (5 = standard)
Packing (N= Tape)
Internal use

PACKAGING

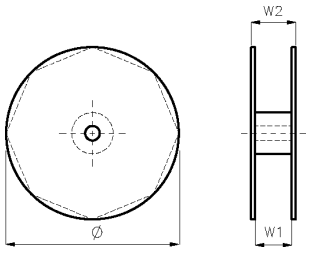
- **Taping and packaging characteristics**



Film Chip



Tape



Reel

Size code	Chip dimensions			Tape and Reel characteristics									Packaging q.ties	
				Tape dimensions						Reel dimensions				
	L	W (mm)	H max (mm)	A0 (mm)	B0 (mm)	K0 (mm)	W (mm)	P (mm)	T (µm)	Ø (mm)	W1 (mm)	W2 (mm)	Reel (pcs)	Loose (pcs)
12.06	3.2	1.6	1.1	2.00	3.60	1.30	8	4	300	180	8	12	3000	2000
12.10	3.2	2.5	1.5-2.0	2.90	3.60	2.10	8	4	300	180	8	12	2250	2000
18.12	4.5	3.2	1.7	3.50	5.10	2.00	12	8	300	330	12	16	4000	1500
			2.3-2.6	4.00	5.30	2.60	12	8			12		3000	
22.20	5.7	5.1	2.3-2.7	5.40	6.20	2.90	12	8	300	330	12	16	3000	1500
			3.3	5.40	6.20	3.80	12	8	300	330	12		2250	
			4.2-4.4	5.40	6.20	4.90	12	8	400	330	12		1750	
28.24	7.1	6.1	3.5	6.60	7.90	3.80	16	8	300	330	16	20	2250	1000
			4.5	6.60	7.90	4.60	16	8	400	330	16		1750	
			5.4	6.60	7.90	5.50	16	8	400	330	16		1500	
40.30	10.2	7.6	3.6	8.40	11.00	3.80	16	12	300	330	16	20	1500	1000
			4.5	8.40	11.00	4.60	16	12	400	330	16		1250	
			5.4-5.6	8.60	11.00	5.80	16	12	400	330	16		1000	
50.40	12.7	10.2	3.6	10.90	13.50	3.80	24	12	300	330	24	28	1500	500
			4-4.5	10.90	13.50	4.70	24	12	400	330	24		1250	
			5.5-5.7	11.00	13.50	5.90	24	12	500	330	24		1000	
60.54	15.2	13.7	3.6	14.40	16.00	4.30	24	16	400	330	24	28	1000	500
			4.5-4.9	14.40	16.00	5.10	24	16	400	330	24		750	
			5.5-5.7	14.40	16.00	5.80	24	16	500	330	24		750	

All dimensions are in mm.

In accordance with IEC 60286-3.
Material used:
- Carrier tape: antistatic material
- Cover tape: polyester + PE
- Reel: recyclable polystyrene

All parts in bulk or on reel are packed in hermetically sealed moisture barrier bag (MBB).

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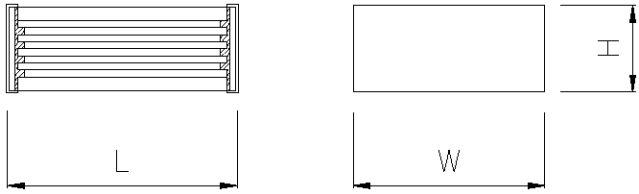
CAPACITANCE AND VOLTAGE RANGE



STANDARD VERSION

Size table

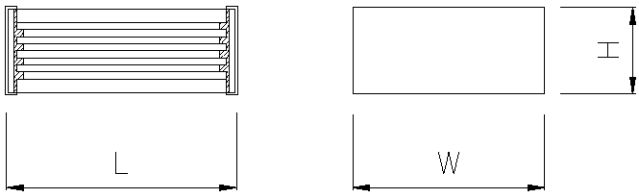
Rated Cap.	50Vdc/40Vac size code	50Vdc/40Vac H max	50Vdc/40Vac Part Number	63Vdc/40Vac Part Number	Qty per reel	100Vdc/63Vac size code	100Vdc/63Vac H max	100Vdc/63Vac Part Number	Qty per reel	250Vdc/120Vac size code	250Vdc/120Vac H max	250Vdc/120Vac Part Number	Qty per reel
1000 pF	18.12	1.7	LDECC1100 - -5- -	LDEDC1100 - -5- -	4000	18.12	1.7	LDEEC1100 - -5- -	4000	18.12	1.7	LDEIC1100 - -5- -	4000
1200 pF	18.12	1.7	LDECC1120 - -5- -	LDEDC1120 - -5- -	4000	18.12	1.7	LDEEC1120 - -5- -	4000	18.12	1.7	LDEIC1120 - -5- -	4000
1500 pF	18.12	1.7	LDECC1150 - -5- -	LDEDC1150 - -5- -	4000	18.12	1.7	LDEEC1150 - -5- -	4000	18.12	1.7	LDEIC1150 - -5- -	4000
1800 pF	18.12	1.7	LDECC1180 - -5- -	LDEDC1180 - -5- -	4000	18.12	1.7	LDEEC1180 - -5- -	4000	18.12	1.7	LDEIC1180 - -5- -	4000
2200 pF	18.12	1.7	LDECC1220 - -5- -	LDEDC1220 - -5- -	4000	18.12	1.7	LDEEC1220 - -5- -	4000	18.12	1.7	LDEIC1220 - -5- -	4000
2700 pF	18.12	1.7	LDECC1270 - -5- -	LDEDC1270 - -5- -	4000	18.12	1.7	LDEEC1270 - -5- -	4000	18.12	1.7	LDEIC1270 - -5- -	4000
3300 pF	18.12	1.7	LDECC1330 - -5- -	LDEDC1330 - -5- -	4000	18.12	1.7	LDEEC1330 - -5- -	4000	18.12	1.7	LDEIC1330 - -5- -	4000
3900 pF	18.12	1.7	LDECC1390 - -5- -	LDEDC1390 - -5- -	4000	18.12	1.7	LDEEC1390 - -5- -	4000	18.12	1.7	LDEIC1390 - -5- -	4000
4700 pF	18.12	1.7	LDECC1470 - -5- -	LDEDC1470 - -5- -	4000	18.12	1.7	LDEEC1470 - -5- -	4000	18.12	1.7	LDEIC1470 - -5- -	4000
5600 pF	18.12	1.7	LDECC1560 - -5- -	LDEDC1560 - -5- -	4000	18.12	1.7	LDEEC1560 - -5- -	4000	18.12	1.7	LDEIC1560 - -5- -	4000
6800 pF	18.12	1.7	LDECC1680 - -5- -	LDEDC1680 - -5- -	4000	18.12	1.7	LDEEC1680 - -5- -	4000	18.12	1.7	LDEIC1680 - -5- -	4000
8200 pF	18.12	1.7	LDECC1820 - -5- -	LDEDC1820 - -5- -	4000	18.12	1.7	LDEEC1820 - -5- -	4000	18.12	1.7	LDEIC1820 - -5- -	4000
0.010 µF	18.12	1.7	LDECC2100 - -5- -	LDEDC2100 - -5- -	4000	18.12	1.7	LDEEC2100 - -5- -	4000	18.12	1.7	LDEIC2100 - -5- -	4000
0.012 µF	18.12	1.7	LDECC2120 - -5- -	LDEDC2120 - -5- -	4000	18.12	1.7	LDEEC2120 - -5- -	4000	18.12	1.7	LDEIC2120 - -5- -	4000
0.015 µF	18.12	1.7	LDECC2150 - -5- -	LDEDC2150 - -5- -	4000	18.12	1.7	LDEEC2150 - -5- -	4000	18.12	1.7	LDEIC2150 - -5- -	4000
0.018 µF	18.12	1.7	LDECC2180 - -5- -	LDEDC2180 - -5- -	4000	18.12	1.7	LDEEC2180 - -5- -	4000	22.20	2.3	LDEID2180 - -5- -	3000
0.022 µF	18.12	1.7	LDECC2220 - -5- -	LDEDC2220 - -5- -	4000	18.12	1.7	LDEEC2220 - -5- -	4000	22.20	2.3	LDEID2220 - -5- -	3000
0.027 µF	18.12	1.7	LDECC2270 - -5- -	LDEDC2270 - -5- -	4000	18.12	1.7	LDEEC2270 - -5- -	4000	22.20	2.3	LDEID2270 - -5- -	3000
0.033 µF	18.12	1.7	LDECC2330 - -5- -	LDEDC2330 - -5- -	4000	18.12	1.7	LDEEC2330 - -5- -	4000	22.20	2.3	LDEID2330 - -5- -	3000
0.039 µF	18.12	1.7	LDECC2390 - -5- -	LDEDC2390 - -5- -	4000	18.12	1.7	LDEEC2390 - -5- -	4000	22.20	2.3	LDEID2390 - -5- -	3000
0.047 µF	18.12	2.3	LDECC2470 - -5- -	LDEDC2470 - -5- -	3000	18.12	2.3	LDEEC2470 - -5- -	3000	22.20	2.3	LDEID2470 - -5- -	3000
0.056 µF	18.12	2.3	LDECC2560 - -5- -	LDEDC2560 - -5- -	3000	18.12	2.3	LDEEC2560 - -5- -	3000	22.20	2.3	LDEID2560 - -5- -	3000
0.068 µF	18.12	2.3	LDECC2680 - -5- -	LDEDC2680 - -5- -	3000	18.12	2.3	LDEEC2680 - -5- -	3000	22.20	2.7	LDEID2680 - -5- -	3000
0.082 µF	18.12	2.3	LDECC2820 - -5- -	LDEDC2820 - -5- -	3000	18.12	2.3	LDEEC2820 - -5- -	3000	28.24	3.5	LDEIE2820 - -5- -	2250
0.10 µF	18.12	2.3	LDECC3100 - -5- -	LDEDC3100 - -5- -	3000	18.12	2.3	LDEEC3100 - -5- -	3000	28.24	3.5	LDEIE3100 - -5- -	2250
0.12 µF	18.12	1.7	LDECC3120 - -5- -	LDEDC3120 - -5- -	4000	22.20	2.3	LDEED3120 - -5- -	3000	28.24	3.5	LDEIE3120 - -5- -	2250
0.15 µF	18.12	1.7	LDECC3150 - -5- -	LDEDC3150 - -5- -	4000	22.20	2.3	LDEED3150 - -5- -	3000	28.24	3.5	LDEIE3150 - -5- -	2250
0.18 µF	18.12	2.3	LDECC3180 - -5- -	LDEDC3180 - -5- -	3000	22.20	2.3	LDEED3180 - -5- -	3000	40.30	3.6	LDEIF3180 - -5- -	1500
0.22 µF	18.12	2.3	LDECC3220 - -5- -	LDEDC3220 - -5- -	3000	22.20	2.3	LDEED3220 - -5- -	3000	40.30	3.6	LDEIF3220 - -5- -	1500
0.27 µF	22.20	2.3	LDECD3270 - -5- -	LDEDD3270 - -5- -	3000	22.20	3.3	LDEED3270 - -5- -	2250	40.30	3.6	LDEIF3270 - -5- -	1500
0.33 µF	22.20	2.3	LDECD3300 - -5- -	LDEDD3300 - -5- -	3000	22.20	3.3	LDEED3330 - -5- -	2250	40.30	3.6	LDEIF3330 - -5- -	1500
0.39 µF	22.20	2.3	LDECD3390 - -5- -	LDEDD3390 - -5- -	3000	28.24	3.5	LDEEE3390 - -5- -	2250	50.40	3.6	LDEIG3390- -5- -	1500
0.47 µF	22.20	2.3	LDECD3470 - -5- -	LDEDD3470 - -5- -	3000	28.24	3.5	LDEEE3470 - -5- -	2250	50.40	3.6	LDEIG3470 - -5- -	1500
0.56 µF	22.20	3.3	LDECD3560 - -5- -	LDEDD3560 - -5- -	2250	28.24	3.5	LDEEE3560 - -5- -	2250	50.40	4.0	LDEIG3560 - -5- -	1250
0.68 µF	22.20	3.3	LDECD3680 - -5- -	LDEDD3680 - -5- -	2250	28.24	3.5	LDEEE3680 - -5- -	2250	60.54	4.5	LDEIH3680 - -5- -	750
0.82 µF	28.24	3.5	LDECE3820 - -5- -	LDEDE3820 - -5- -	2250	40.30	3.6	LDEEF3820 - -5- -	1500	60.54	4.5	LDEIH3820 - -5- -	750
1.0 µF	28.24	3.5	LDECE4100 - -5- -	LDEDE4100 - -5- -	2250	40.30	3.6	LDEEF4100 - -5- -	1500	60.54	4.5	LDEIH4100 - -5- -	750
1.2 µF	28.24	3.5	LDECE4120 - -5- -	LDEDE4120 - -5- -	2250	50.40	3.6	LDEEG4120 - -5- -	1500				
1.5 µF	50.40	3.6	LDECG4150 - -5- -	LDEDG4150 - -5- -	1500	50.40	3.6	LDEEG4150 - -5- -	1500				
1.8 µF	50.40	3.6	LDECG4180 - -5- -	LDEDG4180 - -5- -	1500	50.40	3.6	LDEEG4180 - -5- -	1500				
2.2 µF	50.40	3.6	LDECG4220 - -5- -	LDEDG4220 - -5- -	1500	50.40	3.6	LDEEG4220 - -5- -	1500				
2.7 µF	50.40	4.5	LDECG4270 - -5- -	LDEDG4270 - -5- -	1250	60.54	4.5	LDEEH4270 - -5- -	750				
3.3 µF	60.54	4.5	LDECH4330 - -5- -	LDEDH4330 - -5- -	750	60.54	4.5	LDEEH4330 - -5- -	750				
3.9 µF	60.54	4.5	LDECH4390 - -5- -	LDEDH4390 - -5- -	750	60.54	4.5	LDEEH4390 - -5- -	750				
4.7 µF	60.54	4.9	LDECH4470 - -5- -	LDEDH4470 - -5- -	750	60.54	4.9	LDEEH4470 - -5- -	750				

Tolerance: J (±5%); K (±10%); M (±20%)
Dielectric: A (PEN); B (PET H.T.)
Packing: N (Tape); M (Loose)
Internal use

Size conversion and tolerances

Size code	12.06	12.10	18.12	22.20	28.24	40.30	50.40	60.54
L (mm)	3.2 ±0.3	3.2 ±0.3	4.5 ±0.5	5.7 ±0.5	7.1 ±0.5	10.2 ±0.6	12.7 ±0.6	15.2 ±0.6
W (mm)	1.6 ±0.3	2.5 ±0.3	3.2 ±0.5	5.1 ±0.5	6.1 ±0.5	7.6 ±0.8	10.2 ±0.8	13.7 ±0.8

CAPACITANCE AND VOLTAGE RANGE



MINIATURE VERSION
Size table

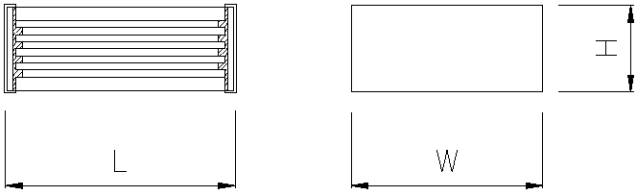
Rated Cap.			50Vdc/40Vac	63Vdc/40Vac	Qty per reel	100Vdc/63Vac			Qty per reel	250Vdc/120Vac			Qty per reel
	size code	H max	Part Number	Part Number		size code	H max	Part Number		size code	H max	Part Number	
1000 pF	12.06	1.1	LDECA1100 - -0- -	LDEDA1100 - -0- -	3000	12.06	1.1	LDEEA1100 - -0- -	3000				
1200 pF	12.06	1.1	LDECA1120 - -0- -	LDEDA1120 - -0- -	3000	12.06	1.1	LDEEA1120 - -0- -	3000				
1500 pF	12.06	1.1	LDECA1150 - -0- -	LDEDA1150 - -0- -	3000	12.06	1.1	LDEEA1150 - -0- -	3000				
1800 pF	12.06	1.1	LDECA1180 - -0- -	LDEDA1180 - -0- -	3000	12.06	1.1	LDEEA1180 - -0- -	3000				
2200 pF	12.06	1.1	LDECA1220 - -0- -	LDEDA1220 - -0- -	3000	12.06	1.1	LDEEA1220 - -0- -	3000				
2700 pF	12.06	1.1	LDECA1270 - -0- -	LDEDA1270 - -0- -	3000	12.06	1.1	LDEEA1270 - -0- -	3000				
3300 pF	12.06	1.1	LDECA1330 - -0- -	LDEDA1330 - -0- -	3000	12.06	1.1	LDEEA1330 - -0- -	3000				
3900 pF	12.06	1.1	LDECA1390 - -0- -	LDEDA1390 - -0- -	3000	12.06	1.1	LDEEA1390 - -0- -	3000				
4700 pF	12.06	1.1	LDECA1470 - -0- -	LDEDA1470 - -0- -	3000	12.06	1.1	LDEEA1470 - -0- -	3000				
5600 pF	12.06	1.1	LDECA1560 - -0- -	LDEDA1560 - -0- -	3000	12.06	1.1	LDEEA1560 - -0- -	3000				
6800 pF	12.06	1.1	LDECA1680 - -0- -	LDEDA1680 - -0- -	3000	12.06	1.1	LDEEA1680 - -0- -	3000				
8200 pF	12.06	1.1	LDECA1820 - -0- -	LDEDA1820 - -0- -	3000	12.06	1.1	LDEEA1820 - -0- -	3000				
0.010 µF	12.06	1.1	LDECA2100 - -0- -	LDEDA2100 - -0- -	3000	12.06	1.1	LDEEA2100 - -0- -	3000				
0.012 µF	12.06	1.1	LDECA2120 - -0- -	LDEDA2120 - -0- -	3000	12.06	1.1	LDEEA2120 - -0- -	3000				
0.015 µF	12.06	1.1	LDECA2150 - -0- -	LDEDA2150 - -0- -	3000	12.06	1.1	LDEEA2150 - -0- -	3000				
0.018 µF	12.06	1.1	LDECA2180 - -0- -	LDEDA2180 - -0- -	3000	12.10	1.5	LDEEB2180 - -0- -	2250	18.12	1.7	LDEIC2180 - -0- -	4000
0.022 µF	12.06	1.1	LDECA2220 - -0- -	LDEDA2220 - -0- -	3000	12.10	1.5	LDEEB2220 - -0- -	2250	18.12	2.3	LDEIC2220 - -0- -	3000
0.027 µF	12.06	1.1	LDECA2270 - -0- -	LDEDA2270 - -0- -	3000	12.10	1.5	LDEEB2270 - -0- -	2250	18.12	2.6	LDEIC2270 - -0- -	3000
0.033 µF	12.06	1.1	LDECA2330 - -0- -	LDEDA2330 - -0- -	3000	12.10	1.5	LDEEB2330 - -0- -	2250	18.12	2.6	LDEIC2330 - -0- -	3000
0.039 µF	12.10	2.0	LDECB2390 - -0- -	LDEDB2390 - -0- -	2250	12.10	2.0	LDEEB2390 - -0- -	2250				
0.047 µF	12.10	2.0	LDECB2470 - -0- -	LDEDB2470 - -0- -	2250	12.10	2.0	LDEEB2470 - -0- -	2250				
0.056 µF	12.10	2.0	LDECB2560 - -0- -	LDEDB2560 - -0- -	2250								
0.068 µF	12.10	2.0	LDECB2680 - -0- -	LDEDB2680 - -0- -	2250								
0.082 µF	12.10	2.0	LDECB2820 - -0- -	LDEDB2820 - -0- -	2250					22.20	3.3	LDEID2820 - -0- -	2250
0.10 µF	12.10	2.0	LDECB3100 - -0- -	LDEDB3100 - -0- -	2250					22.20	3.3	LDEID3100 - -0- -	2250
0.12 µF						18.12	2.6	LDEEC3120 - -0- -	3000	22.20	4.2	LDEID3120 - -0- -	1750
0.15 µF													
0.18 µF										28.24	4.5	LDEIE3180 - -0- -	1750
0.22 µF										28.24	4.5	LDEIE3220 - -0- -	1750
0.27 µF										28.24	5.4	LDEIE3270 - -0- -	1500
0.33 µF													
0.39 µF						22.20	4.2	LDEED3390 - -0- -	1750	40.30	4.5	LDEIF3390 - -0- -	1250
0.47 µF						22.20	4.2	LDEED3470 - -0- -	1750	40.30	5.4	LDEIF3470 - -0- -	1000
0.56 µF						22.20	4.4	LDEED3560 - -0- -	1750	40.30	5.6	LDEIF3560 - -0- -	1000
0.68 µF										50.40	4.5	LDEIG3680 - -0- -	1250
0.82 µF	22.20	4.2	LDECD3820 - -0- -	LDEDD3820 - -0- -	1750	28.24	4.5	LDEEE3820 - -0- -	1750	50.40	5.5	LDEIG3820 - -0- -	1000
1.0 µF	22.20	4.2	LDECD4100 - -0- -	LDEDD4100 - -0- -	1750	28.24	5.4	LDEEE4100 - -0- -	1500				
1.2 µF						40.30	4.5	LDEEF4120 - -0- -	1250	60.54	5.5	LDEIH4120 - -0- -	750
1.5 µF	28.24	4.5	LDECE4150 - -0- -	LDEDE4150 - -0- -	1750	40.30	4.5	LDEEF4150 - -0- -	1250	60.54	5.7	LDEIH4150 - -0- -	750
1.8 µF	28.24	5.4	LDECE4180 - -0- -	LDEDE4180 - -0- -	1500	40.30	5.4	LDEEF4180 - -0- -	1000				
2.2 µF	28.24	5.4	LDECE4220 - -0- -	LDEDE4220 - -0- -	1500	40.30	5.6	LDEEF4220 - -0- -	1000				
2.7 µF	40.30	4.5	LDECF4270 - -0- -	LDEDF4270 - -0- -	1250	50.40	5.5	LDEEG4270 - -0- -	1000				
3.3 µF	40.30	5.4	LDECF4330 - -0- -	LDEDF4330 - -0- -	1000	50.40	5.5	LDEEG4330 - -0- -	1000				
3.9 µF	40.30	5.4	LDECF4390 - -0- -	LDEDF4390 - -0- -	1000	50.40	5.7	LDEEG4390 - -0- -	1000				
4.7 µF	50.40	4.5	LDECG4470- -0- -	LDEDG4470- -0- -	1250								

Tolerance: J (±5%); K (±10%); M (±20%)
Dielectric: A (PEN); B (PET H.T.)
Packing: N (Tape); M (Loose)
Internal use

Size conversion and tolerances

Size code	12.06	12.10	18.12	22.20	28.24	40.30	50.40	60.54
L (mm)	3.2 ±0.3	3.2 ±0.3	4.5 ±0.5	5.7 ±0.5	7.1 ±0.5	10.2 ±0.6	12.7 ±0.6	15.2 ±0.6
W (mm)	1.6 ±0.3	2.5 ±0.3	3.2 ±0.5	5.1 ±0.5	6.1 ±0.5	7.6 ±0.8	10.2 ±0.8	13.7 ±0.8

CAPACITANCE AND VOLTAGE RANGE



PEN HIGH VOLTAGE - STANDARD VERSION

Size table

Rated Cap.	400Vdc/160Vac			Qty per reel	630Vdc/200Vac			Qty per reel
	size code	H max	Part Number		size code	H max	Part Number	
0.010 µF	22.20	2.3	LDEMD2100 - A5- 0	3000	22.20	2.3	LDEPD2100 - A5- 0	3000
0.012 µF	22.20	2.3	LDEMD2120 - A5- 0	3000	22.20	2.3	LDEPD2120 - A5- 0	3000
0.015 µF	22.20	2.3	LDEMD2150 - A5- 0	3000	22.20	3.3	LDEPD2150 - A5- 0	2250
0.018 µF	22.20	2.3	LDEMD2180 - A5- 0	3000	22.20	3.3	LDEPD2180 - A5- 0	2250
0.022 µF	22.20	2.3	LDEMD2220 - A5- 0	3000	22.20	4.2	LDEPD2220 - A5- 0	1750
0.027 µF	22.20	2.3	LDEMD2270 - A5- 0	3000	28.24	3.5	LDEPE2270 - A5- 0	2250
0.033 µF	22.20	3.3	LDEMD2330 - A5- 0	2250	28.24	3.5	LDEPE2330 - A5- 0	2250
0.039 µF	22.20	3.3	LDEMD2390 - A5- 0	2250	28.24	4.5	LDEPE2390 - A5- 0	1750
0.047 µF	22.20	4.2	LDEMD2470 - A5- 0	1750	28.24	5.4	LDEPE2470 - A5- 0	1500
0.056 µF	22.20	4.2	LDEMD2560 - A5- 0	1750	40.30	3.6	LDEPF2560 - A5- 0	1500
0.068 µF	28.24	3.5	LDEME2680 - A5- 0	2250	40.30	3.6	LDEPF2680 - A5- 0	1500
0.082 µF	28.24	4.5	LDEME2820 - A5- 0	1750	40.30	4.5	LDEPF2820 - A5- 0	1250
0.10 µF	28.24	5.4	LDEME3100 - A5- 0	1500	40.30	5.4	LDEPF3100 - A5- 0	1000
0.12 µF	40.30	3.6	LDEMF3120 - A5- 0	1500	50.40	3.6	LDEPG3120 - A5- 0	1500
0.15 µF	40.30	4.5	LDEMF3150 - A5- 0	1250	50.40	4.5	LDEPG3150 - A5- 0	1250
0.18 µF	40.30	4.5	LDEMF3180 - A5- 0	1250	50.40	5.5	LDEPG3180 - A5- 0	1000
0.22 µF	50.40	3.6	LDEMG3220- A5- 0	1500	60.54	4.5	LDEPH3220 - A5- 0	750
0.27 µF	50.40	4.5	LDEMG3270- A5- 0	1250	60.54	4.5	LDEPH3270 - A5- 0	750
0.33 µF	50.40	5.5	LDEMG3330- A5- 0	1000				
0.39 µF	60.54	3.6	LDEMH3390 - A5- 0	1000				
0.47 µF	60.54	4.5	LDEMH3470 - A5- 0	750				
0.56 µF	60.54	5.5	LDEMH3560 - A5- 0	750				

Tolerance: J (±5%)

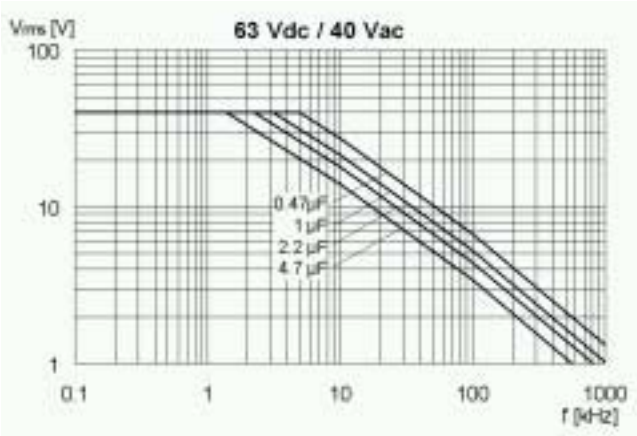
Packing: N (Tape); M (Loose)

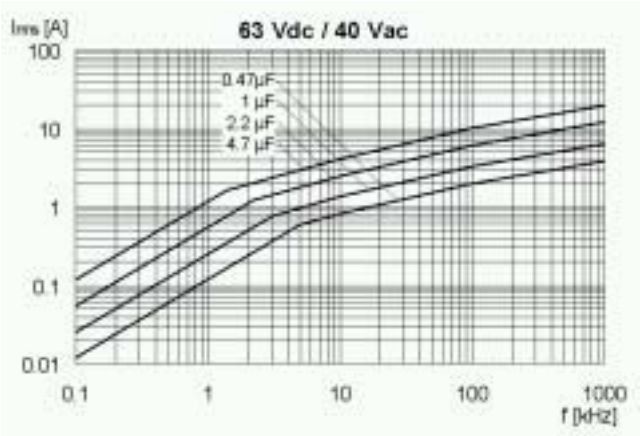
Preliminary

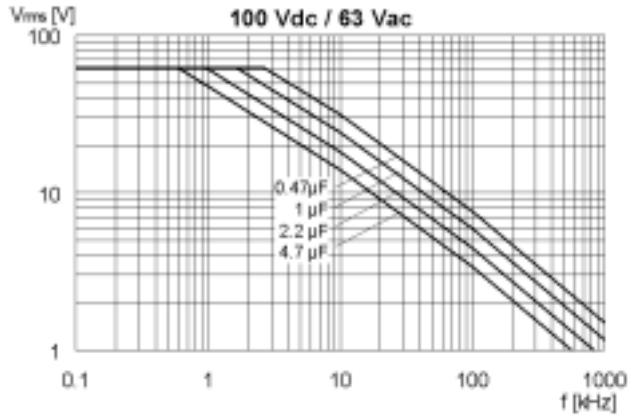
Size conversion and tolerances

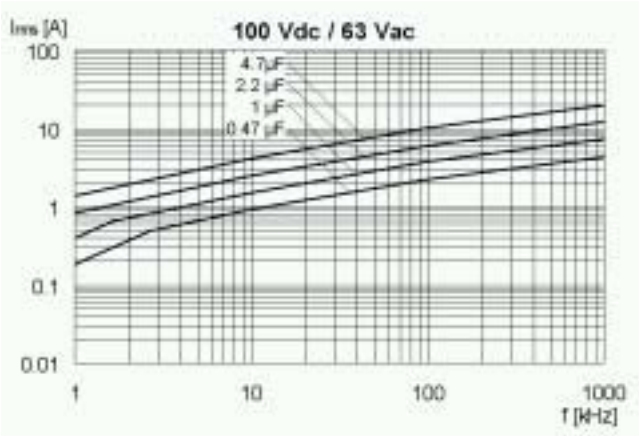
Size code	12.06	12.10	18.12	22.20	28.24	40.30	50.40	60.54
L (mm)	3.2 ±0.3	3.2 ±0.3	4.5 ±0.5	5.7 ±0.5	7.1 ±0.5	10.2 ±0.6	12.7 ±0.6	15.2 ±0.6
W (mm)	1.6 ±0.3	2.5 ±0.3	3.2 ±0.5	5.1 ±0.5	6.1 ±0.5	7.6 ±0.8	10.2 ±0.8	13.7 ±0.8

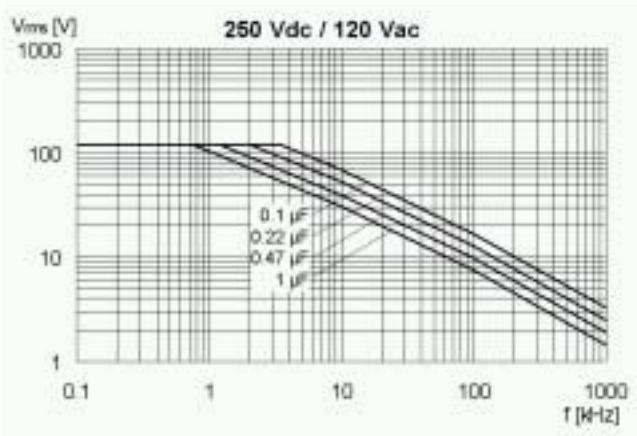
MAX. VOLTAGE (Vr.m.s.) AND CURRENT (Ir.m.s.) VERSUS FREQUENCY
(sinusoidal wave-form / *$T_h \leq 85°C$)

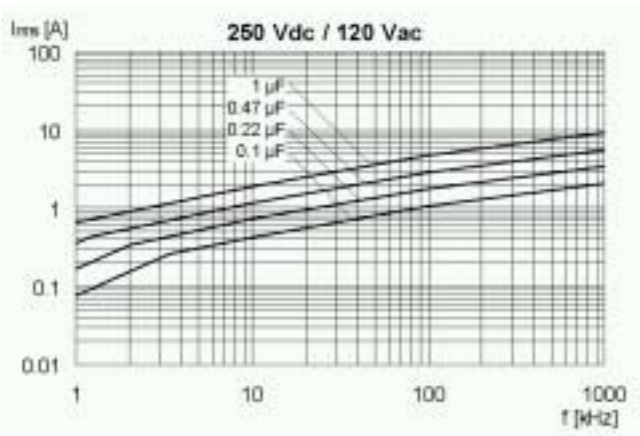








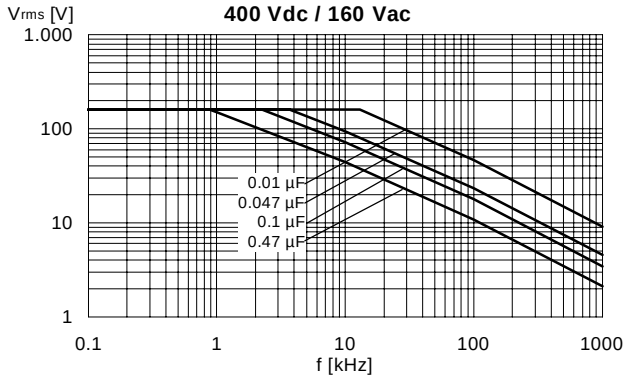


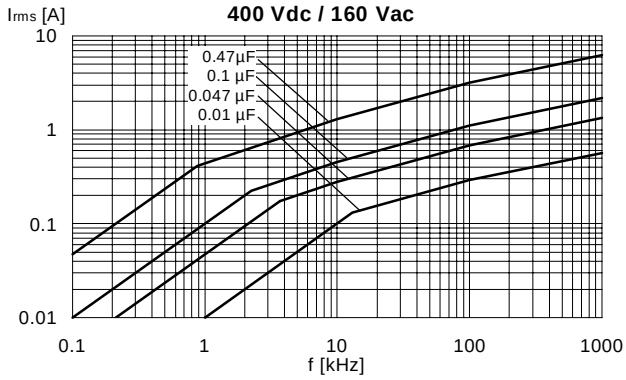


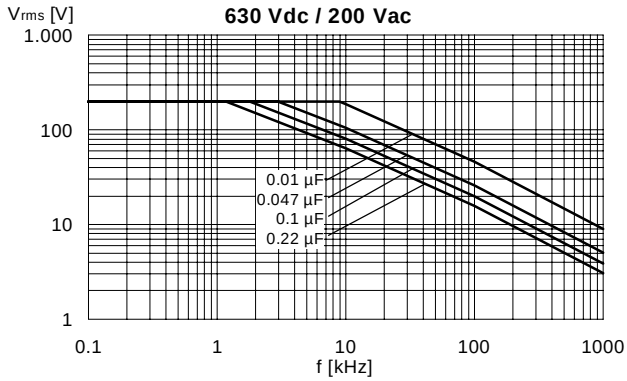
Measure carried out in free air condition.

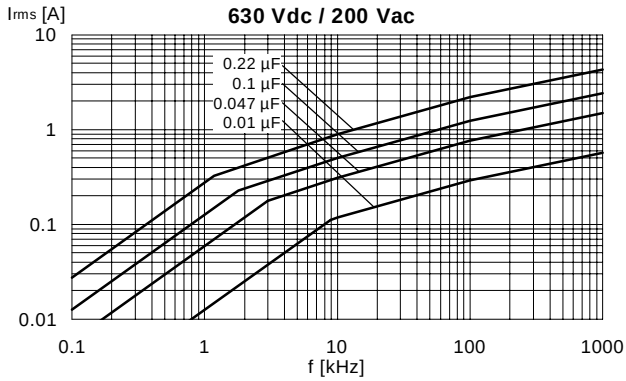
Note: *T_h = max. ambient temperature surrounding the capacitor or hottest contact point (i.e. tracks), whichever is higher, in the worst operation conditions in °C.

MAX. VOLTAGE (Vr.m.s.) AND CURRENT (Ir.m.s.) VERSUS FREQUENCY
(sinusoidal wave-form / *T_h ≤ 85°C)









Measure carried out in free air condition.

Note: *T_h = max. ambient temperature surrounding the capacitor or hottest contact point (i.e. tracks), whichever is higher, in the worst operation conditions in °C.

Preliminary

MOUNTING AND SOLDERING

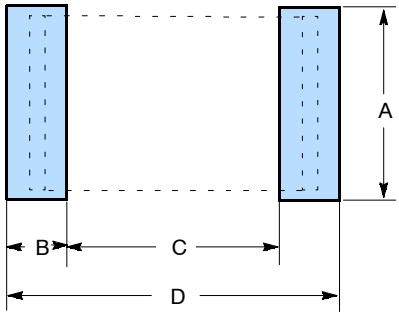
In order to reach a good solderability, we suggest these rules are followed:

- Landing area

Land dimensions

Size	A	B	C	D
1206	2.0	1.3	2.4	5.0
1210	3.0	1.3	2.4	5.0
1812	4.0	1.5	3.5	6.5
2220	5.9	1.9	4.5	8.3
2824	7.0	2.5	5.7	10.7
4030	8.6	3.0	8.0	14.0
5040	11.2	3.5	10.3	17.3
6054	14.6	3.6	12.6	19.8

Example for land dimensions

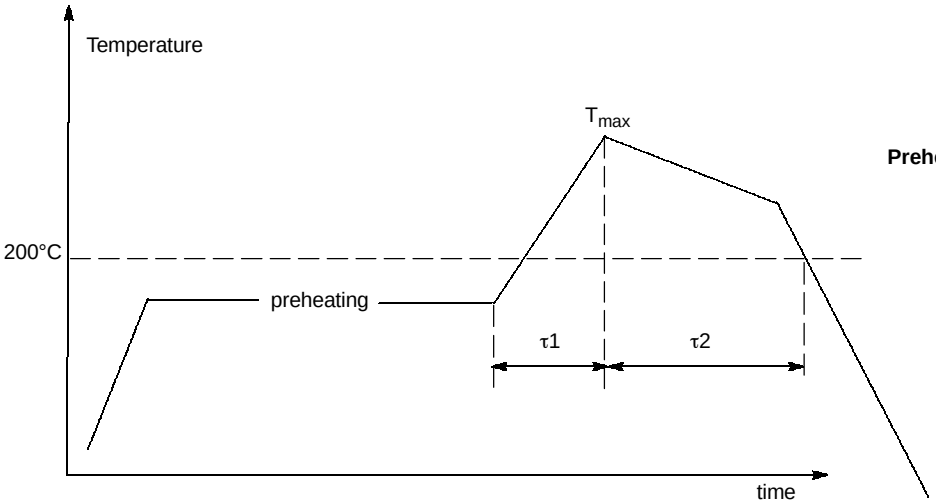


- Solder paste & quantity

To obtain the best performance we advise to use a solder paste alloy TIN (Sn) - LEAD (Pb) - SILVER (Ag) (typical values 62% - 36% - 2%) of no clean type. The thickness of solder paste is also important, and from our experience we suggest the following rule:

Size	Thickness [mm]
from 12.06 to 22.20	0.1 to 0.15
from 28.24 to 60.54	0.1 to 0.20

- Thermal profile



Preheating: Temperature = 150 to 160°C
Time = 3 min

Peak: Max time above 200°C
40 to 50 s and $\tau 1 \leq \tau 2$

T_{max}: from 12.06 to 22.20 T_{max} = 225°C
from 28.24 to 60.54 T_{max} = 235°C

MOISTURE BARRIER BAG (MBB)

- Materials

The MBB is made by three layers: PET, Aluminium and PE for a total thickness of 105 µm

- Moisture resistance

From size 12.06 to 60.54 Arcotronics has tested reels inside this MBB in different extreme conditions (i.e.: T = 60°C R.H. = 95% 56 days).
The result is: THE CAPACITANCE DOESN'T PRESENT ANY SIGNIFICATIVE CHANGE.

- Use

After the opening of the MBB the permanence at a temperature ≤30°C and R.H.≤60% is allowed for a maximum lapse of time of 4 weeks.
For longer times and/or higher T and R.H. values, it is absolutely indispensable to protect the component against R.H.

If the reel is partially used, Arcotronics recommend the re-use of the same MBB or a storage in areas with controlled temperature and humidity.

- Storage

The minimum MBB shelf life is 12 months.

CAUTION

- **Hand assembly**

  If PC boards are assembled by hand, care must be taken to avoid mechanical damage. We recommend:

  - Use tweezers, the components should be gripped across the two terminals, A.
  - Avoid any contact with the cut surface, C.
  - The usage of a pen under vacuum on the surface B is recommended.

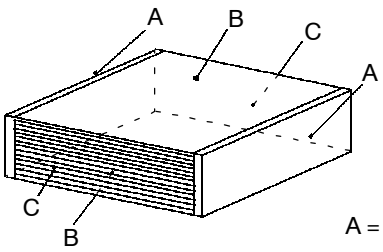


Fig. 1

A = Termination surface

B = External surface

C = Cut surface

- **Soldering iron**

  In case of hand soldering the following recommandations must be taken:

  - Maximum temperature: 250°C on the soldering iron.
  - Soldering time: 5 s max.
  - Avoid contact between the iron soldering and chip.

- **Soldering and flux recommendation**

  - Solder: SnPb solder paste
  - Flux: no-clean flux.

- **Cleaning**

  To clean flux from the PC board assembly, use a suitable solvent such as Isopropylalcohol.
  Solvents such as Toluene, Xylene and Trichloroethylene should be avoided.

CORRECTIVE ACTIONS TABLE (problems after soldering process)

TYPE OF DEFECT	CAUSE	POSSIBLE SOLUTION / ACTION
No solder joint in one end termination	- wrong landing area	- see page 11 /end user
	- quality of solder paste	- see page 11 /end user
	- thermal profile	- see page 11 /end user
	- bad temperature distribution into the reflow oven	- decrease time of preheating or change the orientation of P.C.B. board/end user.
Mechanical deformation of the body	- too high temperature	- apply suggested thermal profile (page 11) / end user
	- too long time	- apply suggested thermal profile (page 11) / end user
	- moisture inside capacitor	- see use suggestion (page 11) / end user
Short circuit	- mechanical damage	- take care to hand assembly (page 12) / end user

Do not hesitate to contact our Technical Service for any doubt or more detailed information.