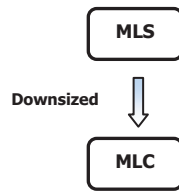




MLC series

Standard RoHS compliant

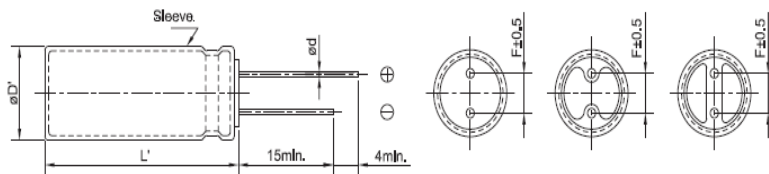
- 85°C 2,000Hrs assured.
- Non-Solvent Proof
- For CAR-Audio,Tuner
- Halogen-free capacitors are also available.



Specifications

Item	Characteristics																																											
Rated Voltage Range	6.3 ~ 250VDC	350 ~ 500VDC																																										
Operating Temperature Range	-40 ~ +85°C	-25 ~ +85°C																																										
Capacitance Tolerance	±20% (M) (at 20°C, 120Hz)																																											
Leakage Current	After 1 minute:0.03 CV(μA)or 4μA,whichever is greater	<table border="1"> <thead> <tr> <th colspan="2">After 1 minute</th> <th colspan="2">After 2 minutes</th> </tr> <tr> <th>Cv≤1,000</th> <th>Cv>1,00</th> <th>Cv≤1,000</th> <th>Cv1>,00</th> </tr> </thead> <tbody> <tr> <td>0.1cv+40</td> <td>0.04cv+100</td> <td>0.03cv+15</td> <td>0.02cv+25</td> </tr> </tbody> </table>	After 1 minute		After 2 minutes		Cv≤1,000	Cv>1,00	Cv≤1,000	Cv1>,00	0.1cv+40	0.04cv+100	0.03cv+15	0.02cv+25																														
	After 1 minute		After 2 minutes																																									
Cv≤1,000	Cv>1,00	Cv≤1,000	Cv1>,00																																									
0.1cv+40	0.04cv+100	0.03cv+15	0.02cv+25																																									
	After 2 minute:0.03 CV(μA)or 3μA,whichever is greater																																											
	Where, C:Nominal capacitance(μF), V:Rated voltage(VDC) (at 20°C, 2 minutes)																																											
Dissipation Factor(Tanδ)	<table border="1"> <thead> <tr> <th>Rated Voltage(VDC)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> <th>160~250</th> <th>350~500</th> </tr> </thead> <tbody> <tr> <td>Tanδ(Max.)</td> <td>0.34</td> <td>0.24</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.09</td> <td>0.20</td> <td>0.24</td> </tr> </tbody> </table>											Rated Voltage(VDC)	6.3	10	16	25	35	50	63	100	160~250	350~500	Tanδ(Max.)	0.34	0.24	0.20	0.16	0.14	0.12	0.10	0.09	0.20	0.24											
	Rated Voltage(VDC)	6.3	10	16	25	35	50	63	100	160~250	350~500																																	
Tanδ(Max.)	0.34	0.24	0.20	0.16	0.14	0.12	0.10	0.09	0.20	0.24																																		
	When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase. (at 20°C, 120Hz)																																											
Temperature characteristics (Max,impedance ratio)	<table border="1"> <thead> <tr> <th>Rated Voltage(VDC)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63~100</th> <th>160</th> <th>200~250</th> <th>350~500</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(20°C)</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>3</td> <td>4</td> <td>6</td> <td>6</td> </tr> <tr> <td>Z(-40°C)/Z(20°C)</td> <td>12</td> <td>10</td> <td>8</td> <td>5</td> <td>4</td> <td>3</td> <td>4</td> <td>4</td> <td>4</td> <td>-</td> </tr> </tbody> </table>											Rated Voltage(VDC)	6.3	10	16	25	35	50	63~100	160	200~250	350~500	Z(-25°C)/Z(20°C)	5	4	3	2	2	2	3	4	6	6	Z(-40°C)/Z(20°C)	12	10	8	5	4	3	4	4	4	-
	Rated Voltage(VDC)	6.3	10	16	25	35	50	63~100	160	200~250	350~500																																	
	Z(-25°C)/Z(20°C)	5	4	3	2	2	2	3	4	6	6																																	
Z(-40°C)/Z(20°C)	12	10	8	5	4	3	4	4	4	-																																		
	(at ,120Hz)																																											
Load life	The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 85°C.																																											
	Capacitance change≤±20% of the initial value Tanδ ≤200% of the initial specified value Leakage current ≤The initial specified value																																											
Shelf life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°C without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes, at least 24 hours and not more than 48 hours before the measurements.																																											
	Capacitance change≤±20% of the initial value Tanδ ≤200% of the initial specified value Leakage current ≤The initial specified value (where, 200% for ≥WV 160 VDC)																																											

Dimension (CE04 Type)



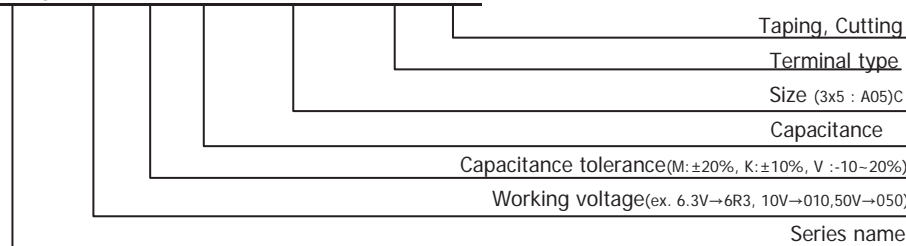
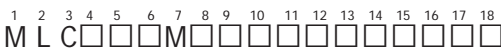
Unit (mm)

	5	6.3	8	10	12.5	16	18	22
ØD	5	6.3	8	10	12.5	16	18	22
Ød	0.5	0.5	0.6	0.6	0.6	0.8	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0
ØD'	ØD+0.5 max.							
L'	L+1.5 max.				L+2.0 max.			

•Printed white color letter on PET/PVC black sleeve

※Ø8 X 9L,ØD'≤D+0.5 and L≤L+1.0

Code numbering system



Ø5	D
Ø6.3	E
Ø8	F
Ø10	G
Ø12.5	X
Ø16	J
Ø18	K
Ø22	M



MLC series ■ Standard Rating

WV (Vdc)	Cap (uF)	Size ØxL (mm)	Tanδ	Ripple Current (mA _{RMS} /85°C, 120Hz)	Code No	
6.3	1,000	8x 16	0.34	540	MLC6R3□102F16CS□□□	
	2,200	10 x16	0.34	890	MLC6R3□222G16CS□□□	
	3,300	10 x 20	0.34	1,190	MLC6R3□332G16CS□□□	
	4,700	12.5 x 20	0.34	1,550	MLC6R3□472X20CS□□□	
	6,800	12.5 x 25	0.38	1,920	MLC6R3□682X25CS□□□	
	10,000	16 x 25	0.46	2,350	MLC6R3□103J25CS□□□	
	15,000	16 x 31.5	0.56	2,550	MLC6R3□153J32CS□□□	
	22,000	18 x 35.5	0.70	3,200	MLC6R3□223K36CS□□□	
	33,000	20 x 40	0.90	3,500	MLC6R3□333L40CS□□□	
	47,000	22 x 50	1.20	3,900	MLC6R3□473M50CS□□□	
10	220	5 x 11	0.24	240	MLC010□221D11CS□□□	
	330	6.3 x 11	0.24	290	MLC010□331E11CS□□□	
	470	6.3 x 11	0.24	350	MLC010□471E11CS□□□	
	680	8 x 11.5	0.24	520	MLC010□681F12CS□□□	
	1,000	10 x 12.5	0.24	650	MLC010□102G13CS□□□	
	2,200	10 x16	0.26	990	MLC010□222G16CS□□□	
	3,300	12.5 x 20	0.28	1,450	MLC010□332X20CS□□□	
	4,700	12.5 x 25	0.30	1,800	MLC010□472X25CS□□□	
	6,800	16x25	0.34	2,250	MLC010□682J25CS□□□	
	10,000	16 x 31.5	0.42	2,550	MLC010□103J32CS□□□	
	15,000	16x 35.5	0.52	2,880	MLC010□153J36CS□□□	
	22,000	18 x 40	0.66	3,400	MLC010□223K40CS□□□	
	33,000	22 x 40	0.88	4,500	MLC010□333M40CS□□□	
	16	220	6.3 x 11	0.20	260	MLC016□221E11CS□□□
330		6.3 x 11	0.20	320	MLC016□331E11CS□□□	
470		8 x 11.5	0.20	440	MLC016□471F12CS□□□	
680		8 x 16	0.20	560	MLC016□681F16CS□□□	
1,000		10 x12.5	0.20	700	MLC016□102G13CS□□□	
2,200		10 x 20	0.20	1,000	MLC016□222G20CS□□□	
3,300		12.5 x 25	0.24	1,700	MLC016□332X25CS□□□	
4,700		16 x 25	0.26	2,100	MLC016□472J25CS□□□	
6,800		16 x 25	0.30	2,250	MLC016□682J25CS□□□	
10,000		16 x 35.5	0.38	2,710	MLC016□103J36CS□□□	
15,000		18 x 40	0.48	3,100	MLC016□153K40CS□□□	
22,000		22 x 40	0.62	3,800	MLC016□223M40CS□□□	
25		100	5 x 11	0.16	180	MLC025□101D11CS□□□
		220	6.3 x 11	0.16	280	MLC025□221E11CS□□□
	330	8 x 11.5	0.16	440	MLC025□331F12CS□□□	
	470	10x 12.5	0.16	550	MLC025□471G13CS□□□	
	680	10 x 16	0.16	680	MLC025□681G16CS□□□	
	1,000	10 x 20	0.16	860	MLC025□102G20CS□□□	
	2,200	12.5 x 25	0.18	1,550	MLC025□222X25CS□□□	
	3,300	16 x 25	0.20	1,980	MLC025□332J25CS□□□	
	4,700	16 x 25	0.22	2,200	MLC025□472J25CS□□□	
	6,800	16 x 35.5	0.26	2,600	MLC025□682J36CS□□□	
	10,000	18 x 40	0.34	2,800	MLC025□103K40CS□□□	
	15,000	22 x 40	0.44	3,800	MLC025□153M40CS□□□	
	35	47	5 x 11	0.14	130	MLC035□470D11CS□□□
		68	6.3 x 11	0.14	160	MLC035□680E11CS□□□
100		6.3 x 11	0.14	210	MLC035□101E11CS□□□	
220		8 x 11.5	0.14	385	MLC035□221F12CS□□□	
330		10 x 12.5	0.14	490	MLC035□331G13CS□□□	
470		10 x 16	0.14	650	MLC035□471G16CS□□□	
680		10 x 20	0.14	820	MLC035□681G20CS□□□	
1,000		12.5 x 20	0.14	1,150	MLC035□102X20CS□□□	
2,200		16 x 25	0.16	1,800	MLC035□222J25CS□□□	
3,300		16 x 31.5	0.18	2,100	MLC035□332J32CS□□□	
4,700		16 x 35.5	0.20	2,500	MLC035□472J36CS□□□	
6,800		18 x 40	0.24	2,800	MLC035□682K40CS□□□	
10,000		22 x 50	0.32	3,500	MLC035□103M50CS□□□	
50		1.0	5 x 11	0.12	17	MLC050□1R0D11CS□□□
	2.2	5 x 11	0.12	28	MLC050□2R2D11CS□□□	
	3.3	5 x 11	0.12	35	MLC050□3R3D11CS□□□	
	4.7	5 x 11	0.12	41	MLC050□4R7D11CS□□□	

WV (Vdc)	Cap (uF)	Size ØxL (mm)	Tanδ	Ripple Current (mA _{RMS} /85°C, 120Hz)	Code No	
50	10	5 x 11	0.12	60	MLC050□100D11CS□□□	
	22	5 x 11	0.12	95	MLC050□220D11CS□□□	
	33	5 x 11	0.12	125	MLC050□330D11CS□□□	
	47	6.3 x 11	0.12	155	MLC050□470E11CS□□□	
	68	6.3 x 11	0.12	210	MLC050□680E11CS□□□	
	100	8 x 11.5	0.12	280	MLC050□101F12CS□□□	
	220	10 x 12.5	0.12	430	MLC050□221G13CS□□□	
	330	10 x 16	0.12	590	MLC050□331G16CS□□□	
	470	10 x 20	0.12	760	MLC050□471G20CS□□□	
	1,000	12.5 x 25	0.12	1,350	MLC050□102X25CS□□□	
	2,200	16 x 31.5	0.14	1,980	MLC050□222J32CS□□□	
	3,300	18 x 35.5	0.16	2,500	MLC050□332K36CS□□□	
	4,700	20 x 40	0.18	2,900	MLC050□472L40CS□□□	
	6,800	22 x 50	0.22	3,500	MLC050□682M50CS□□□	
63	22	5x 11	0.09	100	MLC063□220D11CS□□□	
	33	6.3x 11	0.09	140	MLC063□330E11CS□□□	
	47	6.3 x 11	0.09	170	MLC063□470E11CS□□□	
	68	8 x 11.5	0.09	220	MLC063□680F12CS□□□	
	100	8 x 11.5	0.09	280	MLC063□101F12CS□□□	
	220	10 x 16	0.09	490	MLC063□221G16CS□□□	
	330	10 x 20	0.09	710	MLC063□331G20CS□□□	
	470	12.5 x 20	0.09	900	MLC063□471X20CS□□□	
	1,000	16 x25	0.09	1,300	MLC063□102J25CS□□□	
	2,200	18 x 35.5	0.11	2,300	MLC063□222K36CS□□□	
	3,300	20 x 40	0.13	2,700	MLC063□332L40CS□□□	
	4,700	22 x 50	0.15	3,400	MLC063□472M50CS□□□	
	100	1.0	5 x 11	0.08	21	MLC100□1R0D11CS□□□
		2.2	5 x 11	0.08	30	MLC100□2R2D11CS□□□
3.3		5 x 11	0.08	40	MLC100□3R3D11CS□□□	
4.7		5 x 11	0.08	45	MLC100□4R7D11CS□□□	
6.8		5 x 11	0.08	59	MLC100□6R8D11CS□□□	
10		5 x 11	0.08	70	MLC100□100D11CS□□□	
22		6.3x 11	0.08	130	MLC100□220E11CS□□□	
33		8 x 11.5	0.08	180	MLC100□330F12CS□□□	
47		8 x 11.5	0.08	200	MLC100□470F12CS□□□	
68		10 x 12.5	0.08	270	MLC100□680G13CS□□□	
100		10 x 16	0.08	340	MLC100□101G16CS□□□	
220		12.5 x 20	0.08	550	MLC100□221X20CS□□□	
330		12.5 x 25	0.08	760	MLC100□331X25CS□□□	
470		16 x 25	0.08	1,000	MLC100□471J25CS□□□	
680	16 x 31.5	0.08	1,180	MLC100□681J32CS□□□		
1,000	18 x 35.5	0.08	1,350	MLC100□102K36CS□□□		
2,200	22x50	0.10	2,400	MLC100□222M50CS□□□		
160	10	8 x 11.5	0.20	80	MLC160□100F12CS□□□	
	22	10 x 12.5	0.20	130	MLC160□220G13CS□□□	
	33	10 x 16	0.20	180	MLC160□330G16CS□□□	
	47	10 x 20	0.20	210	MLC160□470G20CS□□□	
	68	12.5 x 20	0.20	350	MLC160□680X20CS□□□	
	100	12.5 x 25	0.20	430	MLC160□101X25CS□□□	
	220	16 x 31.5	0.20	760	MLC160□221J32CS□□□	
	330	18 x 35.5	0.20	995	MLC160□331K36CS□□□	
	470	18 x 40	0.20	1,200	MLC160□471K40CS□□□	
	200	1.0	6.3x 11	0.20	22	MLC200□1R0E11CS□□□
		2.2	6.3x 11	0.20	33	MLC200□2R2E11CS□□□
		3.3	6.3x 11	0.20	40	MLC200□3R3E11CS□□□
		4.7	6.3x 11	0.20	50	MLC200□4R7E11CS□□□
		10	8x 11.5	0.20	80	MLC200□100F11CS□□□
22		10 x 16	0.20	150	MLC200□220G16CS□□□	
33		10 x 20	0.20	205	MLC200□330G20CS□□□	
47		12.5 x 20	0.20	270	MLC200□470X20CS□□□	
68		12.5 x 25	0.20	350	MLC200□680X25CS□□□	
100		16 x 25	0.20	475	MLC200□101J25CS□□□	
220		16 x 35.5	0.20	700	MLC200□221J36CS□□□	
330		18 x 40	0.20	950	MLC200□331K40CS□□□	

MLC SERIES

Standard Rating

WV (Vdc)	Cap (uF)	Size ØxL (mm)	Tanδ	Ripple Current (mA rms/85°C, 120Hz)	Code No
250	3.3	6.3x 11	0.20	40	MLC250□3R3E11CS□□□□
	4.7	6.3x 11	0.20	50	MLC250□4R7E11CS□□□□
	10	10 x 12.5	0.20	100	MLC250□100G13CS□□□□
	22	10 x 20	0.20	170	MLC250□220G20CS□□□□
	33	10 x 20	0.20	200	MLC250□330G20CS□□□□
	47	12.5 x 20	0.20	270	MLC250□470X20CS□□□□
	68	16 x 25	0.20	380	MLC250□680J25CS□□□□
	100	16 x 25	0.20	440	MLC250□101J25CS□□□□
350	2.2	6.3x 11	0.24	30	MLC350□2R2E11CS□□□□
	3.3	8 x 11.5	0.24	46	MLC350□3R3F12CS□□□□
	4.7	8 x 11.5	0.24	55	MLC350□4R7F12CS□□□□
	10	10 x 12.5	0.24	90	MLC350□100G13CS□□□□
	22	12.5 x 20	0.24	185	MLC350□220X20CS□□□□
	33	12.5 x 25	0.24	240	MLC350□330X25CS□□□□
	47	16 x 25	0.24	325	MLC350□470J25CS□□□□
	68	16 x 25	0.24	400	MLC350□680J25CS□□□□
400	1	6.3x 11	0.24	22	MLC400□1R0E11CS□□□□
	2.2	8x 11.5	0.24	38	MLC400□2R2F12CS□□□□
	3.3	8x 11.5	0.24	48	MLC400□3R3F12CS□□□□
	4.7	10 x 12.5	0.24	60	MLC400□4R7G13CS□□□□
	6.8	10 x 16	0.24	80	MLC400□6R8G16CS□□□□
	10	10 x 16	0.24	90	MLC400□100G16CS□□□□
	22	12.5 x 25	0.24	205	MLC400□220X25CS□□□□
	33	16 x 25	0.24	275	MLC400□330J25CS□□□□
	47	16 x 25	0.24	280	MLC400□470J25CS□□□□
	68	16 x 31.5	0.24	340	MLC400□680J32CS□□□□
450	2.2	8 x 11.5	0.24	28	MLC450□2R2F12CS□□□□
	3.3	10 x 12.5	0.24	40	MLC450□3R3G13CS□□□□
	4.7	10 x 12.5	0.24	46	MLC450□4R7G13CS□□□□
	6.8	10 x 16	0.24	66	MLC450□6R8G16CS□□□□
	10	10 x 20	0.24	80	MLC450□100G20CS□□□□
	22	12.5 x 25	0.24	140	MLC450□220X25CS□□□□
	33	16 x 25	0.24	180	MLC450□330J25CS□□□□
	47	16 x 31.5	0.24	220	MLC450□470J32CS□□□□
	68	18 x 35.5	0.24	260	MLC450□680K36CS□□□□
	100	18 x 40	0.24	280	MLC450□101K40CS□□□□
500	1.0	8 x 11.5	0.24	18	MLC500□1R0F12CS□□□□
	2.2	8 x 16	0.24	30	MLC500□2R2F16CS□□□□
	3.3	10 x 12.5	0.24	40	MLC500□3R3G13CS□□□□
	4.7	10 x 16	0.24	58	MLC500□4R7G16CS□□□□
	6.8	10 x 20	0.24	76	MLC500□6R8G20CS□□□□
	10	12.5 x 20	0.24	100	MLC500□100X20CS□□□□
	22	16 x 20	0.24	130	MLC500□220J20CS□□□□
	33	16 x 31.5	0.24	200	MLC500□330J32CS□□□□
	47	18 x 31.5	0.24	220	MLC500□470K32CS□□□□
	68	18 x 35.5	0.24	250	MLC500□680K36CS□□□□

RATED RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers (≤ 180°)

Freq.(Hz)	60	120	300	1k	10k ~
Cap.(μF)					
~6.8	0.65	1.00	1.35	1.75	2.30
10~68	0.75	1.00	1.25	1.50	1.75
100~1,000	0.80	1.00	1.15	1.30	1.40
2,000~	0.85	1.00	1.03	1.05	1.08

Frequency Multipliers (200° ≤)

Freq.(Hz)	60	120	300	1k	10k ~
Cap.(μF)					
6.3 ~50	0.95	1.00	1.03	1.05	1.08
63 ~ 100	0.92	1.00	1.07	1.13	1.19