Chip Solid MnO_2 Tantalum Capacitors – TC2 Series

Operating Temp.: -55℃~+125℃

FEATURES

- Meets or exceeds EIA-535BAAC standard
- Self-healing capability, high reliability
- Excellent stability of capacitance during operating temperature range
- High volumetric efficiency
- 100% surge current test

APPLICATIONS

- Meets or exceeds EIA-535BAAC standard
- Self-healing capability, high reliability
- Excellent stability of capacitance during operating temperature range
- High volumetric efficiency
- 100% surge current test

PRODUCT IDENTIFICATION

TC	212	B	105	M	035	A
①	②	③	④	⑤	⑥	⑦

①

Type	
TC	Solid Tantalum Chip Capacitor
ATC	Solid Tantalum Chip Cap. for Automotive

②

Series	
211	Industrial
212	Low ESR
214	Automotive

③

External Dimensions (L×W) (mm)	
P	2.0×1.2
A	3.2×1.6
B	3.5×2.8
C	6.0×3.2
D/E	7.3×4.3

④

Nominal Capacitance	
Example	Nominal Value
105	1.0μF
106	10μF

⑤

Capacitance Tolerance	
K	±10%
M	±20%

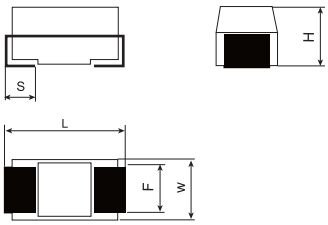
⑥

Rated DC Voltage	
002	2.5Vdc
004	4Vdc
006	6.3Vdc
010	10Vdc
016	16Vdc
020	20Vdc
025	25Vdc
035	35Vdc
050	50Vdc

⑦

Internal Code	
A	Black Molded Case, Ink marking
B	Black Molded Case, Laser marking
Y	Yellow Molded Case, Laser marking

SHAPE AND DIMENSIONS



Unit: mm [inch]

Case	EIA	L	W	H	F	S
P	2012-12	2.00±0.15 [.078±.006]	1.25±0.15 [.049±.006]	1.10±0.15 [.043±.006]	0.90±0.10 [.035±.004]	0.50±0.30 [.020±.012]
A	3216-18	3.20±0.20 [.126±.008]	1.60±0.20 [.063±.008]	1.60±0.20 [.063±.008]	1.20±0.10 [.040±.004]	0.80±0.30 [.031±.012]
B	3528-21	3.50±0.20 [.138±.008]	2.80±0.20 [.110±.008]	1.90±0.20 [.075±.008]	2.20±0.10 [.087±.004]	0.80±0.30 [.030±.012]
C	6032-28	6.00±0.30 [.236±.012]	3.20±0.30 [.126±.012]	2.50±0.30 [.098±.012]	2.20±0.10 [.087±.004]	1.30±0.30 [.051±.012]
D	7343-31	7.30±0.30 [.287±.012]	4.30±0.30 [.169±.012]	2.80±0.30 [.110±.012]	2.40±0.10 [.094±.004]	1.30±0.30 [.051±.012]
E	7343-43	7.30±0.30 [.287±.012]	4.30±0.30 [.169±.012]	4.00±0.30 [.161±.012]	2.40±0.10 [.094±.004]	1.30±0.30 [.051±.012]

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TECHNICAL SPECIFICATION

Item	SPEC									Test Condition
Operating Temp	-55℃~+125℃									
C_R Range	0.10μF~680μF									25℃, 120Hz
C_R Tolerance	±10% or ±20%									25℃, 120Hz
Rated Voltage (V_R)	2.5V	4V	6.3V	10V	16V	20V	25V	35V	50V	85℃
Category Voltage (V_C)	1.6V	2.5V	4V	6.3V	10V	13V	16V	20V	32V	125℃
Surge Voltage (V_S)	3.3V	5.2V	8V	13V	20V	26V	32V	46V	65V	85℃
Surge Voltage (V_S)	2.2V	3.4V	5V	8V	13V	16V	20V	28V	40V	125℃

STANDARD C-V VALUE BY CASE CODE

Rated Voltage (V_R)		2.5	4	6.3	10	16	20	25	35	50
Voltage Code		e	G	J	A	C	D	E	V	T
C_R (μF)	C Code	Case Code								
0.1	104						P		A/P	A
0.15	154						P		A	B/A
0.22	224						P	A	A	B/A
0.33	334						P	A	A	B/A
0.47	474					P	A/P	A/P	B/A	C/B/A
0.68	684				P	A/P	A/P	B/A	B/A	C/B/A
1.0	105			A/P	A/P	A/P	B/A/P	B/A/P	B/A	C/B
1.5	155			A/P	A/P	B/A/P	B/B/A	B/A	C/B	C/B
2.2	225		A	A/P	B/A/P	B/A/P	B/A	C/B/A	C/B/A	D/C/B
3.3	335		A/P	B/A/P	B/A/P	B/A	C/B/A	C/B/A	C/B	D/C/B
4.7	475		B/A/P	B/A/P	B//A/P	C/B/A/P	C/B/A	D/C/B/A	D/C/B	D
6.8	685		B/A/P	B/A/P	C/B/A/P	C/B/A	D/C/B	D/C/B	D/C	D
10	106	A/P	B/A/P	C/B/A/P	C/B/A/P	C/B/A	D/C/B	D/C/B	E/D/C	E/D
15	156	B/A	C/B/A	C/B/A/P	C/B/A	D/C/B	D/C	D/C/B	E/D	E
22	226	A/P	C/B/A	D/B/A/P	D/C/B/A	D/C/B/A	D/C/B	D/C	E/D	
33	336	A/P	D/C/B/A/P	D/C/B/A	D/C/B/A	D/C/B	D/C	E/D	E	
47	476	A	D/C/B/A/P	D/C/B/A	D/C/B/A	D/C/B	E/D/C	E/D	E	
68	686	B/A	D/C/B	D/C/B	D/C/B	D	E/D	E		
100	107	B/A	D/C/B/A	D/C/B/A	D/C/B	D/C	E/D	D		
150	157	B	D/C/B	D/C/B	E/D/C	E/D	E			
220	227	B	D/C/B	E/D/C/B	E/D	E/D				
330	337		E/D/C/B	E/D	E/D	E				
470	477		E	E/D	E					
680	687		E							

※: The first case code is standard product and the others are expansion products.

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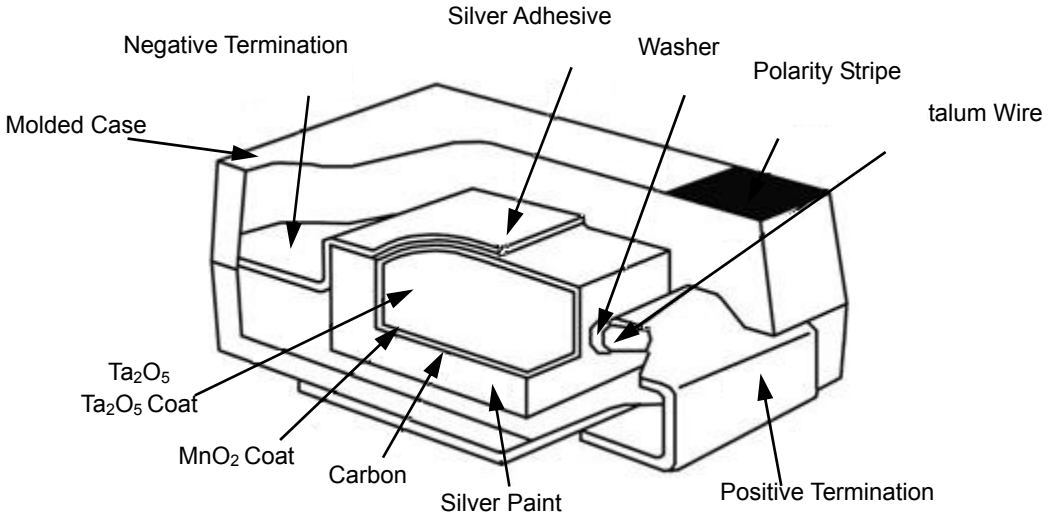
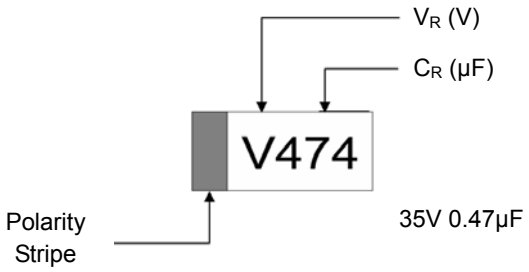
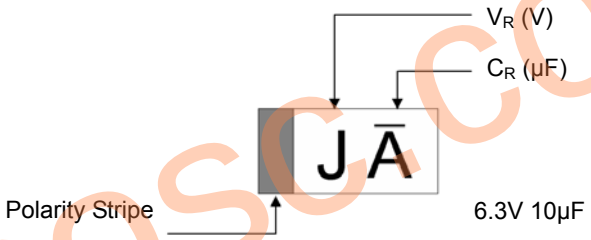
CONSTRUCTION



MARKINGS



A/B/C/D/E Case Marking



P Case Marking

Rated Voltage Code

Rated Voltage(V_R)	2.5	4	6.3	10	16	20	25	35	50
Code	e	G	J	A	C	D	E	V	T

Capacitance Code

Capacitance (μF)	0.1	0.15	0.22	0.33	0.47	0.68	1.0	1.5	2.2	3.3	4.7	6.8
Code (P Case)	A	E	J	N	S	W	A	E	J	N	S	W
Code (A/B/C/D/E Case)	104	154	224	334	474	684	105	155	225	335	475	685
Capacitance (μF)	10	15	22	33	47	68	100	150	220	330	470	680
Code (P Case)	Ā	Ē	J̄	N̄	S̄	W̄						
Code (A/B/C/D/E Case)	106	156	226	336	476	686	107	157	227	337	477	687

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SPECIFICATIONS

TC211 TYPE

Capacitance (μF)	Case	Part Number	DCL (μA) +25℃ Max.	DF (%) +25℃ 120Hz Max.	ESR(Ω) +25℃ 100kHz Max.
2.5V, +85℃ (1.6V @ +125℃)					
10.0	P	TC211P106◎002□	0.5	6.0	6.0
10.0	A	TC211A106◎002□	0.5	6.0	5.0
15.0	A	TC211A156◎002□	0.5	6.0	6.0
15.0	B	TC211B156◎002□	0.5	6.0	4.0
22.0	P	TC211P226◎002□	0.55	20.0	6.0
22.0	A	TC211A226◎002□	0.55	6.0	4.0
33.0	P	TC211P336◎002□	0.82	15.0	6.0
33.0	A	TC211A336◎002□	0.82	6.0	4.0
47.0	A	TC211A476◎002□	1.17	10.0	4.0
68.0	A	TC211A686◎002□	1.7	10.0	3.0
68.0	B	TC211B686◎002□	1.7	6.0	2.0
100.0	A	TC211A107◎002□	2.5	20.0	2.5
100.0	B	TC211B107◎002□	2.5	8.0	1.5
150.0	B	TC211B157◎002□	3.75	10.0	2.0
220.0	B	TC211B227◎002□	5.5	18.0	2.0
4V, +85℃ (2.5V @ +125℃)					
2.2	A	TC211A225◎004□	0.5	6.0	8.0
3.3	P	TC211P335◎004□	0.5	6.0	10.0
3.3	A	TC211A335◎004□	0.5	6.0	8.0
4.7	P	TC211P475◎004□	0.5	6.0	10.0
4.7	A	TC211A475◎004□	0.5	6.0	8.0
6.8	P	TC211P685◎004□	0.5	6.0	10.0
6.8	A	TC211A685◎004□	0.5	6.0	6.0
10.0	P	TC211P106◎004□	0.5	8.0	10.0
10.0	A	TC211A106◎004□	0.5	6.0	6.0
10.0	B	TC211B106◎004□	0.5	6.0	3.5
15.0	A	TC211A156◎004□	0.6	6.0	4.0
15.0	B	TC211B156◎004□	0.6	6.0	3.5
22.0	A	TC211A226◎004□	0.88	6.0	4.0
22.0	B	TC211B226◎004□	0.88	6.0	3.5
33.0	P	TC211P336◎004□	1.32	20.0	4.5
33.0	A	TC211A336◎004□	1.32	6.0	4.0
33.0	B	TC211B336◎004□	1.32	6.0	3.5
33.0	C	TC211C336◎004Y	1.32	6.0	1.8
47.0	P	TC211P476◎004□	3.80	25.0	6.0
47.0	A	TC211A476◎004□	1.88	6.0	3.0
47.0	B	TC211B476◎004□	1.88	6.0	3.0
47.0	C	TC211C476◎004Y	1.88	6.0	1.8
68.0	B	TC211B686◎004□	2.72	6.0	3.5
68.0	C	TC211C686◎004Y	2.72	6.0	1.6
68.0	D	TC211D686◎004Y	2.72	6.0	0.8
100.0	A	TC211A107◎004□	4.0	18.0	5.0
100.0	B	TC211B107◎004□	4.0	8.0	2.0
100.0	C	TC211C107◎004Y	4.0	8.0	1.3
100.0	D	TC211D107◎004Y	4.0	8.0	0.8
150.0	B	TC211B157◎004□	6.0	15.0	2.0
150.0	C	TC211C157◎004Y	6.0	8.0	1.2
150.0	D	TC211D157◎004Y	6.0	8.0	0.8
220.0	B	TC211B227◎004□	8.8	15.0	0.5
220.0	C	TC211C227◎004Y	8.8	8.0	1.0
220.0	D	TC211D227◎004Y	8.8	8.0	0.8
330.0	B	TC211B337◎004□	13.2	18.0	1.2
330.0	C	TC211C337◎004Y	13.2	8.0	1.2
330.0	D	TC211D337◎004Y	13.2	8.0	0.7
330.0	E	TC211E337◎004Y	13.2	8.0	0.7
470.0	E	TC211E477◎004Y	18.8	8.0	0.8
680.0	E	TC211E687◎004Y	27.2	8.0	0.5
6.3V, +85℃ (4.0V @ +125℃)					
1.0	P	TC211P105◎006□	0.5	6.0	25.0
1.0	A	TC211A105◎006□	0.5	6.0	14.0
1.5	P	TC211P155◎006□	0.5	8.0	25.0
1.5	A	TC211A155◎006□	0.5	6.0	8.0
2.2	P	TC211P225◎006□	0.5	8.0	20.0
2.2	A	TC211A225◎006□	0.5	6.0	8.0
3.3	P	TC211P335◎006□	0.5	6.0	10.0
3.3	A	TC211A335◎006□	0.5	6.0	8.0
4.7	P	TC211P475◎006□	0.5	6.0	10.0
4.7	A	TC211A475◎006□	0.5	6.0	6.0
6.8	P	TC211P685◎006□	0.5	6.0	10.0
6.8	A	TC211A685◎006□	0.5	6.0	6.0
6.8	B	TC211B685◎006□	0.5	6.0	3.5
10.0	P	TC211P106◎006□	0.63	8.0	10.0
10.0	A	TC211A106◎006□	0.63	6.0	4.0
10.0	B	TC211B106◎006□	0.63	6.0	3.5
15.0	P	TC211P156◎006□	0.94	10.0	7.0
15.0	A	TC211A156◎006□	0.94	6.0	4.0
15.0	B	TC211B156◎006□	0.94	6.0	3.5
22.0	P	TC211P226◎006□	1.3	18.0	6.0
22.0	A	TC211A226◎006□	1.38	6.0	4.0
22.0	B	TC211B226◎006□	1.38	6.0	3.5
33.0	A	TC211A336◎006□	2.07	8.0	4.5
33.0	B	TC211B336◎006□	2.07	6.0	3.0
33.0	C	TC211C336◎006Y	2.07	6.0	1.8
47.0	A	TC211A476◎006□	2.96	8.0	3.5
47.0	B	TC211B476◎006□	2.96	6.0	3.0
47.0	C	TC211C476◎006Y	2.96	6.0	1.6
68.0	B	TC211B686◎006□	4.28	10.0	1.2
68.0	C	TC211C686◎006Y	4.28	6.0	1.0
68.0	D	TC211D686◎006Y	4.28	6.0	0.8
100.0	A	TC211A107◎006□	6.3	20.0	4.0
100.0	B	TC211B107◎006□	6.3	10.0	3.0
100.0	C	TC211C107◎006Y	6.3	8.0	1.2
100.0	D	TC211D107◎006Y	6.3	8.0	0.8
150.0	B	TC211B157◎006□	9.45	15.0	1.0
150.0	C	TC211C157◎006Y	9.45	8.0	1.2
150.0	D	TC211D157◎006Y	9.45	8.0	0.8
220.0	B	TC211B227◎006□	13.86	18.0	1.0
220.0	C	TC211C227◎006Y	13.86	8.0	1.2
220.0	D	TC211D227◎006Y	13.86	8.0	0.7
220.0	E	TC211E227◎006Y	13.86	8.0	0.5
330.0	D	TC211D337◎006Y	20.79	8.0	0.5

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SPECIFICATIONS

TC211 TYPE

Capacitance (μF)	Case	Part Number	DCL (μA) +25℃ Max.	DF (%) +25℃ 120Hz Max.	ESR(Ω) +25℃ 100kHz Max.
330.0	E	TC211E337◎006Y	20.79	8.0	0.5
470.0	D	TC211D477◎006Y	29.61	12.0	0.4
470.0	E	TC211E477◎006Y	29.61	10.0	0.5
10V, +85℃ (6.3V @ +125℃)					
0.68	P	TC211P684◎010□	0.5	4.0	28.0
1.0	P	TC211P105◎010□	0.5	10.0	25.0
1.0	A	TC211A105◎010□	0.5	4.0	13.0
1.5	P	TC211P155◎010□	0.5	10.0	10.0
1.5	A	TC211A155◎010□	0.5	6.0	8.0
2.2	P	TC211P225◎010□	0.5	6.0	10.0
2.2	A	TC211A225◎010□	0.5	6.0	8.0
3.3	P	TC211P335◎010□	0.5	6.0	15.0
3.3	A	TC211A335◎010□	0.5	6.0	6.0
4.7	P	TC211P475◎010□	0.5	6.0	10.0
4.7	A	TC211A475◎010□	0.5	6.0	6.0
4.7	B	TC211B475◎010□	0.5	6.0	3.5
6.8	P	TC211P685◎010□	0.68	8.0	5.0
6.8	A	TC211A685◎010□	0.68	6.0	6.0
6.8	B	TC211B685◎010□	0.68	6.0	3.5
10.0	P	TC211P106◎010□	1.0	15.0	10.0
10.0	A	TC211A106◎010□	1.0	6.0	4.0
10.0	B	TC211B106◎010□	1.0	6.0	3.5
10.0	C	TC211C106◎010Y	1.0	6.0	1.8
15.0	A	TC211A156◎010□	1.5	6.0	6.0
15.0	B	TC211B156◎010□	1.5	6.0	3.5
15.0	C	TC211C156◎010Y	1.5	6.0	1.8
22.0	A	TC211A226◎010□	2.2	8.0	4.0
22.0	B	TC211B226◎010□	2.2	6.0	3.0
22.0	C	TC211C226◎010Y	2.2	6.0	1.8
33.0	A	TC211A336◎010□	3.3	15.0	6.0
33.0	B	TC211B336◎010□	3.3	6.0	3.5
33.0	C	TC211C336◎010Y	3.3	6.0	1.6
33.0	D	TC211D336◎010Y	3.3	6.0	0.8
47.0	A	TC211A476◎010□	4.7	15.0	4.0
47.0	B	TC211B476◎010□	4.7	6.0	1.0
47.0	C	TC211C476◎010Y	4.7	6.0	1.2
47.0	D	TC211D476◎010Y	4.7	6.0	0.8
68.0	B	TC211B686◎010□	6.8	10.0	3.0
68.0	C	TC211C686◎010Y	6.8	6.0	1.2
68.0	D	TC211D686◎010Y	6.8	6.0	0.8
100.0	B	TC211B107◎010□	10.0	15.0	1.5
100.0	C	TC211C107◎010Y	10.0	8.0	1.2
100.0	D	TC211D107◎010Y	10.0	8.0	0.7
150.0	C	TC211C157◎010Y	15.0	10.0	0.9
150.0	D	TC211D157◎010Y	15.0	8.0	0.7
150.0	E	TC211E157◎010Y	15.0	8.0	0.5
220.0	D	TC211D227◎010Y	22.0	8.0	0.5
220.0	E	TC211E227◎010Y	22.0	8.0	0.5
330.0	D	TC211D337◎010Y	33.0	10.0	0.5
330.0	E	TC211E337◎010Y	33.0	10.0	0.5
470.0	E	TC211E477◎010Y	47.0	10.0	0.5

Capacitance (μF)	Case	Part Number	DCL (μA) +25℃ Max.	DF (%) +25℃ 120Hz Max.	ESR(Ω) +25℃ 100kHz Max.
16V, +85℃ (10V @ +125℃)					
0.47	P	TC211P474◎016□	0.5	6.0	25.0
0.68	P	TC211P684◎016□	0.5	6.0	25.0
1.0	P	TC211P105◎016□	0.5	6.0	25.0
1.0	A	TC211A105◎016□	0.5	4.0	10.0
1.5	P	TC211P155◎016□	0.5	6.0	20.0
1.5	A	TC211A155◎016□	0.5	6.0	8.0
2.2	P	TC211P225◎016□	0.5	6.0	25.0
2.2	A	TC211A225◎016□	0.5	6.0	6.0
2.2	B	TC211B225◎016□	0.5	6.0	4.0
3.3	A	TC211A335◎016□	0.52	6.0	6.0
3.3	B	TC211B335◎016□	0.52	6.0	3.5
4.7	P	TC211P475◎016□	0.8	18.0	15.0
4.7	A	TC211A475◎016□	0.75	6.0	6.0
4.7	B	TC211B475◎016□	0.75	6.0	3.5
4.7	C	TC211C475◎016Y	0.8	6.0	2.4
6.8	A	TC211A685◎016□	1.08	6.0	7.0
6.8	B	TC211B685◎016□	1.08	6.0	3.5
6.8	C	TC211C685◎016Y	1.08	6.0	2.0
10.0	A	TC211A106◎016□	1.6	8.0	7.0
10.0	B	TC211B106◎016□	1.6	6.0	2.8
10.0	C	TC211C106◎016Y	1.6	6.0	1.8
15.0	B	TC211B156◎016□	2.4	6.0	3.0
15.0	C	TC211C156◎016Y	2.4	6.0	1.8
22.0	A	TC211A226◎016□	3.52	15.0	4.0
22.0	B	TC211B226◎016□	3.52	8.0	2.2
22.0	C	TC211C226◎016Y	3.52	6.0	1.6
22.0	D	TC211D226◎016Y	3.52	6.0	0.8
33.0	B	TC211B336◎016□	5.28	8.0	2.0
33.0	C	TC211C336◎016Y	5.28	6.0	1.2
33.0	D	TC211D336◎016Y	5.28	6.0	0.8
47.0	B	TC211B476◎016□	7.52	18.0	1.0
47.0	C	TC211C476◎016Y	7.52	6.0	1.2
47.0	D	TC211D476◎016Y	7.52	6.0	0.8
68.0	D	TC211D686◎016Y	10.8	6.0	0.8
100.0	C	TC211C107◎016Y	16.0	10.0	1.0
100.0	D	TC211D107◎016Y	16.0	8.0	0.7
150.0	D	TC211D157◎016Y	24.0	12.0	0.7
150.0	E	TC211E157◎016Y	24.0	8.0	0.5
220.0	D	TC211D227◎016Y	35.2	15.0	0.9
220.0	E	TC211E227◎016Y	35.2	10.0	0.5
330.0	E	TC211E337◎016Y	52.8	10.0	0.5
20V, +85℃ (13V @ +125℃)					
0.1	P	TC211P104◎020□	0.5	4.0	25.0
0.15	P	TC211P154◎020□	0.5	4.0	25.0
0.22	P	TC211P224◎020□	0.5	4.0	25.0
0.33	P	TC211P334◎020□	0.5	4.0	25.0
0.47	P	TC211P474◎020□	0.5	4.0	25.0
0.68	P	TC211P684◎020□	0.5	4.0	25.0
0.68	A	TC211A684◎020□	0.5	4.0	12.0
1.0	P	TC211P105◎020□	0.5	6.0	15.5

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SPECIFICATIONS

TC211 TYPE

Capacitance (μF)	Case	Part Number	DCL (μA) +25℃ Max.	DF (%) +25℃ 120Hz Max.	ESR(Ω) +25℃ 100kHz Max.
1.0	A	TC211A105◎020□	0.5	4.0	10.0
1.5	A	TC211A155◎020□	0.5	6.0	8.0
1.5	B	TC211B155◎020□	0.5	6.0	5.0
2.2	A	TC211A225◎020□	0.5	6.0	7.0
2.2	B	TC211B225◎020□	0.5	6.0	3.5
3.3	A	TC211A335◎020□	0.66	6.0	7.0
3.3	B	TC211B335◎020□	0.66	6.0	3.5
4.7	A	TC211A475◎020□	0.94	6.0	4.0
4.7	B	TC211B475◎020□	0.94	6.0	3.5
4.7	C	TC211C475◎020Y	0.94	6.0	2.4
6.8	B	TC211B685◎020□	1.36	6.0	3.5
6.8	C	TC211C685◎020Y	1.36	6.0	2.0
6.8	D	TC211D685◎020Y	1.36	6.0	1.9
10.0	B	TC211B106◎020□	2.0	6.0	3.0
10.0	C	TC211C106◎020Y	2.0	6.0	1.8
10.0	D	TC211D106◎020Y	2.0	6.0	1.0
15.0	C	TC211C156◎020Y	3.0	6.0	1.7
15.0	D	TC211D156◎020Y	3.0	6.0	1.0
22.0	B	TC211B226◎020□	4.4	8.0	4.0
22.0	C	TC211C226◎020Y	4.4	6.0	1.2
22.0	D	TC211D226◎020Y	4.4	6.0	0.8
33.0	C	TC211C336◎020Y	6.6	6.0	1.2
33.0	D	TC211D336◎020Y	6.6	6.0	0.8
47.0	C	TC211C476◎020Y	9.4	10.0	1.0
47.0	D	TC211D476◎020Y	9.4	6.0	0.8
47.0	E	TC211E476◎020Y	9.4	6.0	0.8
68.0	D	TC211D686◎020Y	13.6	6.0	0.8
68.0	E	TC211E686◎020Y	13.6	6.0	0.8
100.0	D	TC211D107◎020Y	20.0	8.0	0.6
100.0	E	TC211E107◎020Y	20.0	8.0	0.5
150.0	E	TC211E157◎020Y	30.0	8.0	0.5
25V, +85℃ (16V @ +125℃)					
0.22	A	TC211A224◎025□	0.5	4.0	15.0
0.33	A	TC211A334◎025□	0.5	4.0	15.0
0.47	A	TC211A474◎025□	0.5	4.0	14.0
0.47	P	TC211P474◎025□	0.5	4.0	13.0
0.68	A	TC211A684◎025□	0.5	4.0	10.0
1.0	P	TC211P105◎025□	0.5	6.0	12.0
1.0	A	TC211A105◎025□	0.5	4.0	8.0
1.0	B	TC211B105◎025□	0.5	4.0	5.0
1.5	A	TC211A155◎025□	0.5	6.0	10.0
1.5	B	TC211B155◎025□	0.5	6.0	5.0
2.2	A	TC211A225◎025□	0.6	6.0	6.0
2.2	B	TC211B225◎025□	0.55	6.0	4.5
2.2	C	TC211C225◎025Y	0.55	6.0	3.5
3.3	A	TC211A335◎025□	0.82	6.0	7.0
3.3	B	TC211B335◎025□	0.82	6.0	3.5
3.3	C	TC211C335◎025Y	0.82	6.0	2.5
4.7	A	TC211A475◎025□	1.17	8.0	6.0
4.7	B	TC211B475◎025□	1.17	6.0	2.0
4.7	C	TC211C475◎025Y	1.17	6.0	2.4
6.8	B	TC211B685◎025□	1.7	6.0	3.0

Capacitance (μF)	Case	Part Number	DCL (μA) +25℃ Max.	DF (%) +25℃ 120Hz Max.	ESR(Ω) +25℃ 100kHz Max.
6.8	C	TC211C685◎025Y	1.7	6.0	1.9
6.8	D	TC211D685◎025Y	1.7	6.0	1.2
10.0	B	TC211B106◎025□	2.5	6.0	3.0
10.0	C	TC211C106◎025Y	2.5	6.0	1.5
10.0	D	TC211D106◎025Y	2.5	6.0	1.0
15.0	B	TC211B156◎025□	3.75	8.0	4.0
15.0	C	TC211C156◎025Y	3.75	6.0	1.5
15.0	D	TC211D156◎025Y	3.75	6.0	1.0
22.0	C	TC211C226◎025Y	5.5	6.0	1.4
22.0	D	TC211D226◎025Y	5.5	6.0	0.8
33.0	D	TC211D336◎025Y	8.25	6.0	0.8
33.0	E	TC211E336◎025Y	8.25	6.0	0.7
47.0	D	TC211D476◎025Y	11.7	6.0	0.8
47.0	E	TC211E476◎025Y	11.7	6.0	0.7
68.0	E	TC211E686◎025Y	17.0	6.0	0.7
100.0	D	TC211D107◎025Y	25.0	10.0	1.2
35V, +85℃ (20V @ +125℃)					
0.1	P	TC211P104◎035□	0.5	4.0	30.0
0.1	A	TC211A104◎035□	0.5	4.0	20.0
0.15	A	TC211A154◎035□	0.5	4.0	19.0
0.22	A	TC211A224◎035□	0.5	4.0	18.0
0.33	A	TC211A334◎035□	0.5	4.0	15.0
0.47	A	TC211A474◎035□	0.5	4.0	14.0
0.47	B	TC211B474◎035□	0.5	4.0	8.0
0.68	A	TC211A684◎035□	0.5	4.0	10.0
0.68	B	TC211B684◎035□	0.5	4.0	6.5
1.0	A	TC211A105◎035□	0.5	4.0	10.0
1.0	B	TC211B105◎035□	0.5	4.0	5.0
1.5	B	TC211B155◎035□	0.52	6.0	5.0
1.5	C	TC211C155◎035Y	0.52	6.0	4.5
2.2	A	TC211A225◎035□	0.77	6.0	6.0
2.2	B	TC211B225◎035□	0.77	6.0	4.0
2.2	C	TC211C225◎035Y	0.77	6.0	3.5
3.3	B	TC211B335◎035□	1.15	6.0	3.5
3.3	C	TC211C335◎035Y	1.15	6.0	2.5
4.7	B	TC211B475◎035□	1.64	6.0	2.0
4.7	C	TC211C475◎035Y	1.64	6.0	2.5
4.7	D	TC211D475◎035Y	1.64	6.0	1.5
6.8	C	TC211C685◎035Y	2.38	6.0	2.0
6.8	D	TC211D685◎035Y	2.38	6.0	1.5
10.0	C	TC211C106◎035Y	3.5	6.0	2.0
10.0	D	TC211D106◎035Y	3.5	6.0	1.0
10.0	E	TC211E106◎035Y	3.5	6.0	1.0
15.0	D	TC211D156◎035Y	5.25	6.0	1.0
15.0	E	TC211E156◎035Y	5.25	6.0	0.9
22.0	D	TC211D226◎035Y	7.7	6.0	0.8
22.0	E	TC211E226◎035Y	7.7	6.0	0.7
33.0	E	TC211E336◎035Y	11.0	6.0	0.6
47.0	E	TC211E476◎035Y	16.5	8.0	0.6
50V, +85℃ (32V @ +125℃)					
0.1	A	TC211A104◎050□	0.5	4.0	22.0
0.15	A	TC211A154◎050□	0.5	4.0	19.0

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SPECIFICATIONS

TC211 TYPE

Capacitance (μF)	Case	Part Number	DCL (μA) +25℃ Max.	DF (%) +25℃ 120Hz Max.	ESR(Ω) +25℃ 100kHz Max.
0.15	B	TC211B154◎050□	0.5	4.0	16.0
0.22	A	TC211A224◎050□	0.5	4.0	18.0
0.22	B	TC211B224◎050□	0.5	4.0	14.0
0.33	A	TC211A334◎050□	0.5	4.0	15.0
0.33	B	TC211B334◎050□	0.5	4.0	10.0
0.47	A	TC211A474◎050□	0.5	4.0	3.0
0.47	B	TC211B474◎050□	0.5	4.0	9.0
0.47	C	TC211C474◎050Y	0.5	4.0	8.0
0.68	A	TC211A684◎050□	0.5	4.0	4.0
0.68	B	TC211B684◎050□	0.5	4.0	8.0
0.68	C	TC211C684◎050Y	0.5	4.0	7.0
1.0	B	TC211B105◎050□	0.5	6.0	6.0
1.0	C	TC211C105◎050Y	0.5	4.0	5.5

Capacitance (μF)	Case	Part Number	DCL (μA) +25℃ Max.	DF (%) +25℃ 120Hz Max.	ESR(Ω) +25℃ 100kHz Max.
1.5	B	TC211B155◎050□	0.75	6.0	4.5
1.5	C	TC211C155◎050Y	0.75	6.0	3.5
2.2	B	TC211B225◎050□	1.1	6.0	2.0
2.2	C	TC211C225◎050Y	1.1	6.0	3.5
2.2	D	TC211D225◎050Y	1.1	6.0	2.5
3.3	B	TC211B335◎050□	1.65	6.0	1.7
3.3	C	TC211C335◎050Y	1.65	6.0	3.0
3.3	D	TC211D335◎050Y	1.65	6.0	2.0
4.7	D	TC211D475◎050Y	2.35	6.0	1.5
6.8	D	TC211D685◎050Y	3.4	6.0	1.2
10.0	D	TC211D106◎050Y	5.0	6.0	1.0
10.0	E	TC211E106◎050Y	5.0	6.0	0.7
15.0	E	TC211E156◎050Y	7.5	6.0	0.7

TC212 TYPE

Capacitance (μF)	Case	Part Number	DCL (μA) +25℃ Max.	DF (%) +25℃ 120Hz Max.	ESR(Ω) +25℃ 100kHz Max.
2.5V, +85℃ (1.6V @ +125℃)					
10.0	P	TC212P106◎002□	0.5	6.0	5.0
10.0	A	TC212A106◎002□	0.5	6.0	4.0
15.0	A	TC212A156◎002□	0.5	6.0	4.0
15.0	B	TC212B156◎002□	0.5	6.0	3.0
22.0	P	TC212P226◎002□	0.55	20.0	4.0
22.0	A	TC212A226◎002□	0.55	6.0	3.0
33.0	P	TC212P336◎002□	0.82	15.0	4.0
33.0	A	TC212A336◎002□	0.82	6.0	3.0
47.0	A	TC212A476◎002□	1.17	10.0	3.0
68.0	A	TC212A686◎002□	1.7	10.0	2.5
68.0	B	TC212B686◎002□	1.7	6.0	1.8
100.0	A	TC212A107◎002□	2.5	10.0	2.0
100.0	B	TC212B107◎002□	2.5	8.0	1.5
150.0	B	TC212B157◎002□	3.75	10.0	1.5
220.0	B	TC212B227◎002□	5.5	18.0	1.5
4V, +85℃ (2.5V @ +125℃)					
2.2	A	TC212A225◎004□	0.5	6.0	6.0
3.3	P	TC212P335◎004□	0.5	6.0	8.0
3.3	A	TC212A335◎004□	0.5	6.0	6.0
4.7	P	TC212P475◎004□	0.5	6.0	6.0
4.7	A	TC212A475◎004□	0.5	6.0	5.0
6.8	P	TC212P685◎004□	0.5	6.0	7.0
6.8	A	TC212A685◎004□	0.5	6.0	4.0
10.0	P	TC212P106◎004□	0.5	8.0	6.0
10.0	A	TC212A106◎004□	0.5	6.0	3.0
10.0	B	TC212B106◎004□	0.5	6.0	1.5
15.0	A	TC212A156◎004□	0.6	6.0	1.5
15.0	B	TC212B156◎004□	0.6	6.0	1.2
22.0	A	TC212A226◎004□	0.88	6.0	1.5
22.0	B	TC212B226◎004□	0.88	6.0	0.6
33.0	P	TC212P336◎004□	1.32	20.0	2.0

Capacitance (μF)	Case	Part Number	DCL (μA) +25℃ Max.	DF (%) +25℃ 120Hz Max.	ESR(Ω) +25℃ 100kHz Max.
33.0	A	TC212A336◎004□	1.32	6.0	2.5
33.0	B	TC212B336◎004□	1.32	6.0	0.5
33.0	C	TC212C336◎004Y	1.32	6.0	0.8
47.0	P	TC212P476◎004□	3.80	25.0	4.0
47.0	A	TC212A476◎004□	1.88	6.0	2.0
47.0	B	TC212B476◎004□	1.88	6.0	0.8
47.0	C	TC212C476◎004Y	1.88	6.0	1.0
68.0	B	TC212B686◎004□	2.72	6.0	2.5
68.0	C	TC212C686◎004Y	2.72	6.0	0.5
68.0	D	TC212D686◎004Y	2.72	6.0	0.5
100.0	A	TC212A107◎004□	4.0	18.0	3.0
100.0	B	TC212B107◎004□	4.0	8.0	1.0
100.0	C	TC212C107◎004Y	4.0	8.0	0.35
100.0	D	TC212D107◎004Y	4.0	8.0	0.2
150.0	B	TC212B157◎004□	6.0	15.0	1.0
150.0	C	TC212C157◎004Y	6.0	8.0	0.3
150.0	D	TC212D157◎004Y	6.0	8.0	0.2
220.0	B	TC212B227◎004□	8.8	15.0	0.4
220.0	C	TC212C227◎004Y	8.8	8.0	0.5
220.0	D	TC212D227◎004Y	8.8	8.0	0.3
330.0	B	TC212B337◎004□	13.2	18.0	0.7
330.0	C	TC212C337◎004Y	13.2	8.0	0.8
330.0	D	TC212D337◎004Y	13.2	8.0	0.2
330.0	E	TC212E337◎004Y	13.2	8.0	0.2
470.0	E	TC212E477◎004Y	18.8	8.0	0.2
680.0	E	TC212E687◎004Y	27.2	8.0	0.2
6.3V, +85℃ (4.0V @ +125℃)					
1.0	P	TC212P105◎006□	0.5	6.0	15.0
1.0	A	TC212A105◎006□	0.5	6.0	10.0
1.5	P	TC212P155◎006□	0.5	8.0	10.0
1.5	A	TC212A155◎006□	0.5	6.0	6.0
2.2	P	TC212P225◎006□	0.5	8.0	10.0

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SPECIFICATIONS

TC212 TYPE

Capacitance (μF)	Case	Part Number	DCL (μA) +25℃ Max.	DF (%) +25℃ 120Hz Max.	ESR(Ω) +25℃ 100kHz Max.
2.2	A	TC212A225◎006□	0.5	6.0	6.0
3.3	P	TC212P335◎006□	0.5	6.0	5.0
3.3	A	TC212A335◎006□	0.5	6.0	6.0
4.7	P	TC212P475◎006□	0.5	6.0	6.0
4.7	A	TC212A475◎006□	0.5	6.0	4.0
6.8	P	TC212P685◎006□	0.5	6.0	8.0
6.8	A	TC212A685◎006□	0.5	6.0	3.5
6.8	B	TC212B685◎006□	0.5	6.0	3.0
10.0	P	TC212P106◎006□	0.63	8.0	6.0
10.0	A	TC212A106◎006□	0.63	6.0	2.0
10.0	B	TC212B106◎006□	0.63	6.0	1.0
15.0	P	TC212P156◎006□	0.94	10.0	5.0
15.0	A	TC212A156◎006□	0.94	6.0	2.0
15.0	B	TC212B156◎006□	0.94	6.0	0.7
22.0	P	TC212P226◎006□	1.3	18.0	4.0
22.0	A	TC212A226◎006□	1.38	6.0	2.5
22.0	B	TC212B226◎006□	1.38	6.0	0.8
33.0	A	TC212A336◎006□	2.07	8.0	1.5
33.0	B	TC212B336◎006□	2.07	6.0	0.8
33.0	C	TC212C336◎006Y	2.07	6.0	0.3
47.0	A	TC212A476◎006□	2.96	8.0	2.5
47.0	B	TC212B476◎006□	2.96	6.0	0.5
47.0	C	TC212C476◎006Y	2.96	6.0	0.3
68.0	B	TC212B686◎006□	4.28	10.0	0.65
68.0	C	TC212C686◎006Y	4.28	6.0	0.2
68.0	D	TC212D686◎006Y	4.28	6.0	0.2
100.0	A	TC212A107◎006□	6.3	20.0	2.0
100.0	B	TC212B107◎006□	6.3	10.0	1.5
100.0	C	TC212C107◎006Y	6.3	8.0	0.3
100.0	D	TC212D107◎006Y	6.3	8.0	0.2
150.0	B	TC212B157◎006□	9.45	15.0	0.6
150.0	C	TC212C157◎006Y	9.45	8.0	0.3
150.0	D	TC212D157◎006Y	9.45	8.0	0.2
220.0	B	TC212B227◎006□	13.86	18.0	0.7
220.0	C	TC212C227◎006Y	13.86	8.0	0.3
220.0	D	TC212D227◎006Y	13.86	8.0	0.15
220.0	E	TC212E227◎006Y	13.86	8.0	0.15
330.0	D	TC212D337◎006Y	20.79	8.0	0.15
330.0	E	TC212E337◎006Y	20.79	8.0	0.15
470.0	D	TC212D477◎006Y	29.61	12.0	0.15
470.0	E	TC212E477◎006Y	29.61	10.0	0.12
10V, +85℃ (6.3V @ +125℃)					
0.68	P	TC212P684◎010□	0.5	4.0	15.0
1.0	P	TC212P105◎010□	0.5	10.0	10.0
1.0	A	TC212A105◎010□	0.5	4.0	8.0
1.5	P	TC212P155◎010□	0.5	10.0	6.0
1.5	A	TC212A155◎010□	0.5	6.0	6.0
2.2	P	TC212P225◎010□	0.5	6.0	8.0
2.2	A	TC212A225◎010□	0.5	6.0	6.0
3.3	P	TC212P335◎010□	0.5	6.0	10.0
3.3	A	TC212A335◎010□	0.5	6.0	4.0

Capacitance (μF)	Case	Part Number	DCL (μA) +25℃ Max.	DF (%) +25℃ 120Hz Max.	ESR(Ω) +25℃ 100kHz Max.
4.7	P	TC212P475◎010□	0.5	6.0	8.0
4.7	A	TC212A475◎010□	0.5	6.0	3.0
4.7	B	TC212B475◎010□	0.5	6.0	1.5
6.8	P	TC212P685◎010□	0.68	8.0	3.0
6.8	A	TC212A685◎010□	0.68	6.0	3.0
6.8	B	TC212B685◎010□	0.68	6.0	1.2
10.0	P	TC212P106◎010□	1.0	15.0	6.0
10.0	A	TC212A106◎010□	1.0	6.0	1.8
10.0	B	TC212B106◎010□	1.0	6.0	0.8
10.0	C	TC212C106◎010Y	1.0	6.0	0.6
15.0	A	TC212A156◎010□	1.5	6.0	4.0
15.0	B	TC212B156◎010□	1.5	6.0	0.7
15.0	C	TC212C156◎010Y	1.5	6.0	0.5
22.0	A	TC212A226◎010□	2.2	8.0	2.5
22.0	B	TC212B226◎010□	2.2	6.0	1.0
22.0	C	TC212C226◎010Y	2.2	6.0	0.4
33.0	A	TC212A336◎010□	3.3	15.0	4.0
33.0	B	TC212B336◎010□	3.3	6.0	1.0
33.0	C	TC212C336◎010Y	3.3	6.0	0.4
33.0	D	TC212D336◎010Y	3.3	6.0	0.25
47.0	A	TC212A476◎010□	4.7	15.0	1.5
47.0	B	TC212B476◎010□	4.7	6.0	0.65
47.0	C	TC212C476◎010Y	4.7	6.0	0.30
47.0	D	TC212D476◎010Y	4.7	6.0	0.22
68.0	B	TC212B686◎010□	6.8	10.0	1.5
68.0	C	TC212C686◎010Y	6.8	6.0	0.30
68.0	D	TC212D686◎010Y	6.8	6.0	0.20
100.0	B	TC212B107◎010□	10.0	15.0	1.0
100.0	C	TC212C107◎010Y	10.0	8.0	0.20
100.0	D	TC212D107◎010Y	10.0	8.0	0.15
150.0	C	TC212C157◎010Y	15.0	10.0	0.70
150.0	D	TC212D157◎010Y	15.0	8.0	0.15
150.0	E	TC212E157◎010Y	15.0	8.0	0.15
220.0	D	TC212D227◎010Y	22.0	8.0	0.15
220.0	E	TC212E227◎010Y	22.0	8.0	0.15
330.0	D	TC212D337◎010Y	33.0	10.0	0.15
330.0	E	TC212E337◎010Y	33.0	10.0	0.2
470.0	E	TC212E477◎010Y	47.0	10.0	0.2
16V, +85℃ (10V @ +125℃)					
0.47	P	TC212P474◎016□	0.5	6.0	15.0
0.68	P	TC212P684◎016□	0.5	6.0	15.0
1.0	P	TC212P105◎016□	0.5	6.0	10.0
1.0	A	TC212A105◎016□	0.5	4.0	8.0
1.5	P	TC212P155◎016□	0.5	6.0	10.0
1.5	A	TC212A155◎016□	0.5	6.0	8.0
2.2	P	TC212P225◎016□	0.5	6.0	15.0
2.2	A	TC212A225◎016□	0.5	6.0	6.0
2.2	B	TC212B225◎016□	0.5	6.0	3.0
3.3	A	TC212A335◎016□	0.52	6.0	5.0
3.3	B	TC212B335◎016□	0.52	6.0	2.5
4.7	P	TC212P475◎016□	0.8	18.0	10.0

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SPECIFICATIONS

TC212 TYPE

Capacitance (μF)	Case	Part Number	DCL (μA) +25℃ Max.	DF (%) +25℃ 120Hz Max.	ESR(Ω) +25℃ 100kHz Max.
4.7	A	TC212A475◎016□	0.75	6.0	5.0
4.7	B	TC212B475◎016□	0.75	6.0	2.5
4.7	C	TC212C475◎016Y	0.8	6.0	1.5
6.8	A	TC212A685◎016□	1.08	6.0	5.0
6.8	B	TC212B685◎016□	1.08	6.0	2.5
6.8	C	TC212C685◎016Y	1.08	6.0	1.0
10.0	A	TC212A106◎016□	1.6	8.0	3.0
10.0	B	TC212B106◎016□	1.6	6.0	0.8
10.0	C	TC212C106◎016Y	1.6	6.0	1.5
15.0	B	TC212B156◎016□	2.4	6.0	2.0
15.0	C	TC212C156◎016Y	2.4	6.0	1.2
22.0	A	TC212A226◎016□	3.52	15.0	2.0
22.0	B	TC212B226◎016□	3.52	8.0	1.5
22.0	C	TC212C226◎016Y	3.52	6.0	1.2
22.0	D	TC212D226◎016Y	3.52	6.0	0.6
33.0	B	TC212B336◎016□	5.28	8.0	1.0
33.0	C	TC212C336◎016Y	5.28	6.0	1.0
33.0	D	TC212D336◎016Y	5.28	6.0	0.5
47.0	B	TC212B476◎016□	7.52	18.0	0.7
47.0	C	TC212C476◎016Y	7.52	6.0	0.8
47.0	D	TC212D476◎016Y	7.52	6.0	0.5
68.0	D	TC212D686◎016Y	10.8	6.0	0.5
100.0	C	TC212C107◎016Y	16.0	10.0	0.7
100.0	D	TC212D107◎016Y	16.0	8.0	0.5
150.0	D	TC212D157◎016Y	24.0	12.0	0.4
150.0	E	TC212E157◎016Y	24.0	8.0	0.15
220.0	D	TC212D227◎016Y	35.2	15.0	0.6
220.0	E	TC212E227◎016Y	35.2	10.0	0.2
330.0	E	TC212E337◎016Y	52.8	10.0	0.2
20V, +85℃ (13V @ +125℃)					
0.1	P	TC212P104◎020□	0.5	4.0	15.0
0.15	P	TC212P154◎020□	0.5	4.0	15.0
0.22	P	TC212P224◎020□	0.5	4.0	15.0
0.33	P	TC212P334◎020□	0.5	4.0	15.0
0.47	P	TC212P474◎020□	0.5	4.0	15.0
0.68	P	TC212P684◎020□	0.5	4.0	15.0
0.68	A	TC212A684◎020□	0.5	4.0	10.0
1.0	P	TC212P105◎020□	0.5	6.0	15.0
1.0	A	TC212A105◎020□	0.5	4.0	8.0
1.5	A	TC212A155◎020□	0.5	6.0	4.5
1.5	B	TC212B155◎020□	0.5	6.0	1.5
2.2	A	TC212A225◎020□	0.5	6.0	4.0
2.2	B	TC212B225◎020□	0.5	6.0	3.0
3.3	A	TC212A335◎020□	0.66	6.0	6.0
3.3	B	TC212B335◎020□	0.66	6.0	2.5
4.7	A	TC212A475◎020□	0.94	6.0	3.5
4.7	B	TC212B475◎020□	0.94	6.0	2.5
4.7	C	TC212C475◎020Y	0.94	6.0	1.2
6.8	B	TC212B685◎020□	1.36	6.0	2.5
6.8	C	TC212C685◎020Y	1.36	6.0	1.2
6.8	D	TC212D685◎020Y	1.36	6.0	0.8

Capacitance (μF)	Case	Part Number	DCL (μA) +25℃ Max.	DF (%) +25℃ 120Hz Max.	ESR(Ω) +25℃ 100kHz Max.
10.0	B	TC212B106◎020□	2.0	6.0	2.0
10.0	C	TC212C106◎020Y	2.0	6.0	1.2
10.0	D	TC212D106◎020Y	2.0	6.0	0.8
15.0	C	TC212C156◎020Y	3.0	6.0	1.2
15.0	D	TC212D156◎020Y	3.0	6.0	0.8
22.0	B	TC212B226◎020□	4.4	8.0	3.0
22.0	C	TC212C226◎020Y	4.4	6.0	0.4
22.0	D	TC212D226◎020Y	4.4	6.0	0.5
33.0	C	TC212C336◎020Y	6.6	6.0	0.6
33.0	D	TC212D336◎020Y	6.6	6.0	0.4
47.0	C	TC212C476◎020Y	9.4	10.0	0.8
47.0	D	TC212D476◎020Y	9.4	6.0	0.6
47.0	E	TC212E476◎020Y	9.4	6.0	0.3
68.0	D	TC212D686◎020Y	13.6	6.0	0.4
68.0	E	TC212E686◎020Y	13.6	6.0	0.3
100.0	D	TC212D107◎020Y	20.0	8.0	0.2
100.0	E	TC212E107◎020Y	20.0	8.0	0.2
150.0	E	TC212E157◎020Y	30.0	8.0	0.2
25V, +85℃ (16V @ +125℃)					
0.22	A	TC212A224◎025□	0.5	4.0	10.0
0.33	A	TC212A334◎025□	0.5	4.0	12.0
0.47	P	TC212P474◎025□	0.5	4.0	8.0
0.47	A	TC212A474◎025□	0.5	4.0	10.0
0.68	A	TC212A684◎025□	0.5	4.0	6.0
1.0	P	TC212P105◎025□	0.5	6.0	8.0
1.0	A	TC212A105◎025□	0.5	4.0	6.0
1.0	B	TC212B105◎025□	0.5	4.0	4.0
1.5	A	TC212A155◎025□	0.5	6.0	5.0
1.5	B	TC212B155◎025□	0.5	6.0	3.5
2.2	A	TC212A225◎025□	0.6	6.0	4.0
2.2	B	TC212B225◎025□	0.55	6.0	3.0
2.2	C	TC212C225◎025Y	0.55	6.0	2.0
3.3	A	TC212A335◎025□	0.82	6.0	3.0
3.3	B	TC212B335◎025□	0.82	6.0	2.5
3.3	C	TC212C335◎025Y	0.82	6.0	2.0
4.7	A	TC212A475◎025□	1.17	8.0	3.0
4.7	B	TC212B475◎025□	1.17	6.0	1.0
4.7	C	TC212C475◎025Y	1.17	6.0	2.4
6.8	B	TC212B685◎025□	1.7	6.0	1.2
6.8	C	TC212C685◎025Y	1.7	6.0	0.8
6.8	D	TC212D685◎025Y	1.7	6.0	0.5
10.0	B	TC212B106◎025□	2.5	6.0	2.0
10.0	C	TC212C106◎025Y	2.5	6.0	1.4
10.0	D	TC212D106◎025Y	2.5	6.0	0.8
15.0	B	TC212B156◎025□	3.75	8.0	3.0
15.0	C	TC212C156◎025Y	3.75	6.0	1.2
15.0	D	TC212D156◎025Y	3.75	6.0	0.8
22.0	C	TC212C226◎025Y	5.5	6.0	1.0
22.0	D	TC212D226◎025Y	5.5	6.0	0.6
33.0	D	TC212D336◎025Y	8.25	6.0	0.6
33.0	E	TC212E336◎025Y	8.25	6.0	0.5

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SPECIFICATIONS

TC212 TYPE

Capacitance (μF)	Case	Part Number	DCL (μA) +25℃ Max.	DF (%) +25℃ 120Hz Max.	ESR(Ω) +25℃ 100kHz Max.
47.0	D	TC212D476◎025Y	11.7	6.0	0.4
47.0	E	TC212E476◎025Y	11.7	6.0	0.4
68.0	E	TC212E686◎025Y	17.0	6.0	0.3
100.0	D	TC212D107◎025Y	25.0	10.0	0.7
35V, +85℃ (20V @ +125℃)					
0.1	P	TC212P104◎035□	0.5	4.0	20.0
0.1	A	TC212A104◎035□	0.5	4.0	15.0
0.15	A	TC212A154◎035□	0.5	4.0	12.0
0.22	A	TC212A224◎035□	0.5	4.0	12.0
0.33	A	TC212A334◎035□	0.5	4.0	12.0
0.47	A	TC212A474◎035□	0.5	4.0	10.0
0.47	B	TC212B474◎035□	0.5	4.0	6.0
0.68	A	TC212A684◎035□	0.5	4.0	6.0
0.68	B	TC212B684◎035□	0.5	4.0	6.0
1.0	A	TC212A105◎035□	0.5	4.0	8.0
1.0	B	TC212B105◎035□	0.5	4.0	2.0
1.5	B	TC212B155◎035□	0.52	6.0	4.0
1.5	C	TC212C155◎035Y	0.52	6.0	3.0
2.2	A	TC212A225◎035□	0.77	6.0	3.0
2.2	B	TC212B225◎035□	0.77	6.0	3.0
2.2	C	TC212C225◎035Y	0.77	6.0	2.5
3.3	B	TC212B335◎035□	1.15	6.0	3.0
3.3	C	TC212C335◎035Y	1.15	6.0	2.0
4.7	B	TC212B475◎035□	1.64	6.0	1.0
4.7	C	TC212C475◎035Y	1.64	6.0	2.0
4.7	D	TC212D475◎035Y	1.64	6.0	1.0
6.8	C	TC212C685◎035Y	2.38	6.0	1.2
6.8	D	TC212D685◎035Y	2.38	6.0	0.8
10.0	C	TC212C106◎035Y	3.5	6.0	1.5
10.0	D	TC212D106◎035Y	3.5	6.0	0.6
10.0	E	TC212E106◎035Y	3.5	6.0	0.6
15.0	D	TC212D156◎035Y	5.25	6.0	0.8
15.0	E	TC212E156◎035Y	5.25	6.0	0.6

Capacitance (μF)	Case	Part Number	DCL (μA) +25℃ Max.	DF (%) +25℃ 120Hz Max.	ESR(Ω) +25℃ 100kHz Max.
22.0	D	TC212D226◎035Y	7.7	6.0	0.6
22.0	E	TC212E226◎035Y	7.7	6.0	0.3
33.0	E	TC212E336◎035Y	11.0	6.0	0.5
47.0	E	TC212E476◎035Y	16.5	8.0	0.5
50V, +85℃ (32V @ +125℃)					
0.1	A	TC212A104◎050□	0.5	4.0	15.0
0.15	A	TC212A154◎050□	0.5	4.0	15.0
0.15	B	TC212B154◎050□	0.5	4.0	12.0
0.22	A	TC212A224◎050□	0.5	4.0	15.0
0.22	B	TC212B224◎050□	0.5	4.0	12.0
0.33	A	TC212A334◎050□	0.5	4.0	12.0
0.33	B	TC212B334◎050□	0.5	4.0	2.5
0.47	A	TC212A474◎050□	0.5	4.0	2.0
0.47	B	TC212B474◎050□	0.5	4.0	6.0
0.47	C	TC212C474◎050Y	0.5	4.0	5.0
0.68	A	TC212A684◎050□	0.5	4.0	3.0
0.68	B	TC212B684◎050□	0.5	4.0	5.0
0.68	C	TC212C684◎050Y	0.5	4.0	4.0
1.0	B	TC212B105◎050□	0.5	6.0	4.0
1.0	C	TC212C105◎050Y	0.5	4.0	3.5
1.5	B	TC212B155◎050□	0.75	6.0	3.5
1.5	C	TC212C155◎050Y	0.75	6.0	2.5
2.2	B	TC212B225◎050□	1.1	6.0	1.5
2.2	C	TC212C225◎050Y	1.1	6.0	3.0
2.2	D	TC212D225◎050Y	1.1	6.0	2.0
3.3	B	TC212B335◎050□	1.65	6.0	1.2
3.3	C	TC212C335◎050Y	1.65	6.0	2.0
3.3	D	TC212D335◎050Y	1.65	6.0	1.0
4.7	D	TC212D475◎050Y	2.35	6.0	0.8
6.8	D	TC212D685◎050Y	3.4	6.0	0.7
10.0	D	TC212D106◎050Y	5.0	6.0	0.7
10.0	E	TC212E106◎050Y	5.0	6.0	0.4
15.0	E	TC212E156◎050Y	7.5	6.0	0.4

ATC214 TYPE

Capacitance (μF)	Case	Part Number	DCL (μA) +25℃ Max.	DF (%) +25℃ 120Hz Max.	ESR(Ω) +25℃ 100kHz Max.
4V, +85℃（2.5V @ +125℃）					
2.2	A	ATC214A225◎004□	0.5	6.0	6.0
3.3	A	ATC214A335◎004□	0.5	6.0	6.0
4.7	B	ATC214B475◎004□	0.5	6.0	6.0
6.8	B	ATC214B685◎004□	0.5	6.0	6.0
10.0	B	ATC214B106◎004□	0.5	6.0	1.5
15.0	C	ATC214C156◎004Y	0.5	6.0	1.5
22.0	C	ATC214C226◎004Y	0.6	6.0	1.0
33.0	D	ATC214D336◎004Y	1.3	6.0	1.0
47.0	D	ATC214D476◎004Y	1.9	6.0	1.0
68.0	D	ATC214D686◎004Y	2.7	6.0	0.5
100	D	ATC214D107◎004Y	4.0	8.0	0.3

Capacitance (μF)	Case	Part Number	DCL (μA) +25℃ Max.	DF (%) +25℃ 120Hz Max.	ESR(Ω) +25℃ 100kHz Max.
6.3V, +85℃（4.0V @ +125℃）					
1.5	A	ATC214A155◎006□	0.5	6.0	6.0
2.2	A	ATC214A225◎006□	0.5	6.0	6.0
3.3	B	ATC214B335◎006□	0.5	6.0	8.0
4.7	B	ATC214B475◎006□	0.5	6.0	10.0
6.8	B	ATC214B685◎006□	0.5	6.0	1.2
10.0	C	ATC214C106◎006Y	0.6	6.0	0.6
15.0	C	ATC214C156◎006Y	0.9	6.0	0.6
22.0	D	ATC214D226◎006Y	1.3	6.0	0.5
33.0	D	ATC214D336◎006Y	2.1	6.0	0.3
47.0	D	ATC214D476◎006Y	3.0	6.0	0.3
68.0	D	ATC214D686◎006Y	4.3	6.0	0.2

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SPECIFICATIONS

ATC214 TYPE

Capacitance (μF)	Case	Part Number	DCL (μA) +25℃ Max.	DF (%) +25℃ 120Hz Max.	ESR(Ω) +25℃ 100kHz Max.
10V, +85℃（6.3V @ +125℃）					
1.0	A	ATC214A105◎010□	0.5	4.0	6.0
1.5	A	ATC214A155◎010□	0.5	6.0	6.0
2.2	B	ATC214B225◎010□	0.5	6.0	3.0
3.3	B	ATC214B335◎010□	0.5	6.0	3.0
4.7	B	ATC214B475◎010□	0.5	6.0	1.5
6.8	C	ATC214C685◎010Y	0.7	6.0	0.8
10.0	C	ATC214C106◎010Y	1.0	6.0	0.6
15.0	C	ATC214C156◎010Y	1.5	6.0	0.5
22.0	D	ATC214D226◎010Y	2.2	6.0	0.4
33.0	D	ATC214D336◎010Y	3.3	6.0	0.25
47.0	D	ATC214D476◎010Y	4.7	6.0	0.22
16V, +85℃（10V @ +125℃）					
0.68	A	ATC214A684◎016□	0.5	6.0	10.0
1.0	A	ATC214A105◎016□	0.5	4.0	6.0
1.5	B	ATC214B155◎016□	0.5	6.0	4.0
2.2	B	ATC214B225◎016□	0.5	6.0	3.0
3.3	B	ATC214B335◎016□	0.5	6.0	2.5
4.7	C	ATC214C475◎016Y	0.8	6.0	1.5
6.8	C	ATC214C685◎016Y	1.1	6.0	1.0
10.0	C	ATC214C106◎016Y	1.6	6.0	1.5
15.0	D	ATC214D156◎016Y	2.4	6.0	0.5
22.0	D	ATC214D226◎016Y	3.5	6.0	0.25
33.0	D	ATC214D336◎016Y	5.3	6.0	0.25
20V, +85℃（13V @ +125℃）					
0.47	A	ATC214A474◎020□	0.5	4.0	10.0
0.68	A	ATC214A684◎020□	0.5	4.0	8.0
1.0	B	ATC214B105◎020□	0.5	4.0	6.0
1.5	B	ATC214B155◎020□	0.5	6.0	1.5
2.2	B	ATC214B225◎020□	0.5	6.0	3.0
3.3	C	ATC214C335◎020Y	0.7	6.0	1.5
4.7	C	ATC214C475◎020Y	0.9	6.0	1.2
6.8	D	ATC214D685◎020Y	1.4	6.0	0.8
10.0	D	ATC214D106◎020Y	2.0	6.0	0.8
15.0	D	ATC214D156◎020Y	3.0	6.0	0.8
22.0	D	ATC214D226◎020Y	4.4	6.0	0.5
25V, +85℃（16V @ +125℃）					
0.33	A	ATC214A334◎025□	0.5	4.0	12.0
0.47	A	ATC214A474◎025□	0.5	4.0	10.0
0.68	B	ATC214B684◎025□	0.5	4.0	6.0
1.0	B	ATC214B105◎025□	0.5	4.0	4.0
1.5	B	ATC214B155◎025□	0.5	6.0	3.5
2.2	C	ATC214C225◎025Y	0.6	6.0	2.0
3.3	C	ATC214C335◎025Y	0.8	6.0	2.0
4.7	D	ATC214D475◎025Y	1.2	6.0	1.5
6.8	D	ATC214D685◎025Y	1.7	6.0	1.0
10.0	D	ATC214D106◎025Y	2.5	6.0	0.8
15.0	D	ATC214D156◎025Y	3.8	6.0	0.8
35V, +85℃（20V @ +125℃）					
0.1	A	ATC214A104◎035□	0.5	4.0	15.0
0.15	A	ATC214A154◎035□	0.5	4.0	12.0
0.22	A	ATC214A224◎035□	0.5	4.0	12.0
0.33	A	ATC214A334◎035□	0.5	4.0	12.0
0.47	B	ATC214B474◎035□	0.5	4.0	2.5
0.68	B	ATC214B684◎035□	0.5	4.0	2.5
1.0	B	ATC214B105◎035□	0.5	4.0	2.0
1.5	B	ATC214B155◎035□	0.5	4.0	2.0
1.5	C	ATC214C155◎035Y	0.5	6.0	2.5
2.2	C	ATC214C225◎035Y	0.8	6.0	1.5
3.3	D	ATC214D335◎035Y	1.2	6.0	1.5
4.7	D	ATC214D475◎035Y	1.6	6.0	1.0
6.8	D	ATC214D685◎035Y	2.4	6.0	0.8
10.0	D	ATC214D106◎035Y	3.5	6.0	0.6
50V, +85℃（32V @ +125℃）					
0.1	A	ATC214A104◎050□	0.5	4.0	15.0
0.15	B	ATC214B154◎050□	0.5	4.0	12.0
0.22	B	ATC214B224◎050□	0.5	4.0	12.0
0.33	B	ATC214B334◎050□	0.5	4.0	2.5
0.47	C	ATC214C474◎050Y	0.5	4.0	5.0
0.68	C	ATC214C684◎050Y	0.5	4.0	4.0
1.0	C	ATC214C105◎050Y	0.5	4.0	3.5
1.5	D	ATC214D155◎050Y	0.8	6.0	2.5
2.2	D	ATC214D225◎050Y	1.1	6.0	2.0
3.3	D	ATC214D335◎050Y	1.7	6.0	1.0
4.7	D	ATC214D475◎050Y	2.4	6.0	0.8

※◎:Capacitance tolerance code (K=±10%，M=±20%);
※□: Internal code (A=Black molded case, Ink marking; B=Black molded case, Laser marking; Y=Yellow molded case, Laser marking).

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