

# Chip Solid MnO<sub>2</sub> Tantalum Capacitors – TC2 Series

Operating Temp.: -55°C ~ +125°C



## 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

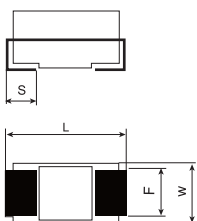
- Communication
- Consumer electronics
- Automotive electronics
- Instruments
- Medical electronics

## PRODUCT IDENTIFICATION

<b>TC</b>	<b>212</b>	<b>B</b>	<b>105</b>	<b>M</b>	<b>035</b>	<b>B</b>																																		
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## SHAPE AND DIMENSIONS

Unit: mm [inch]



Case	EIA	L	W	H	F	S
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]

## TECHNICAL SPECIFICATION

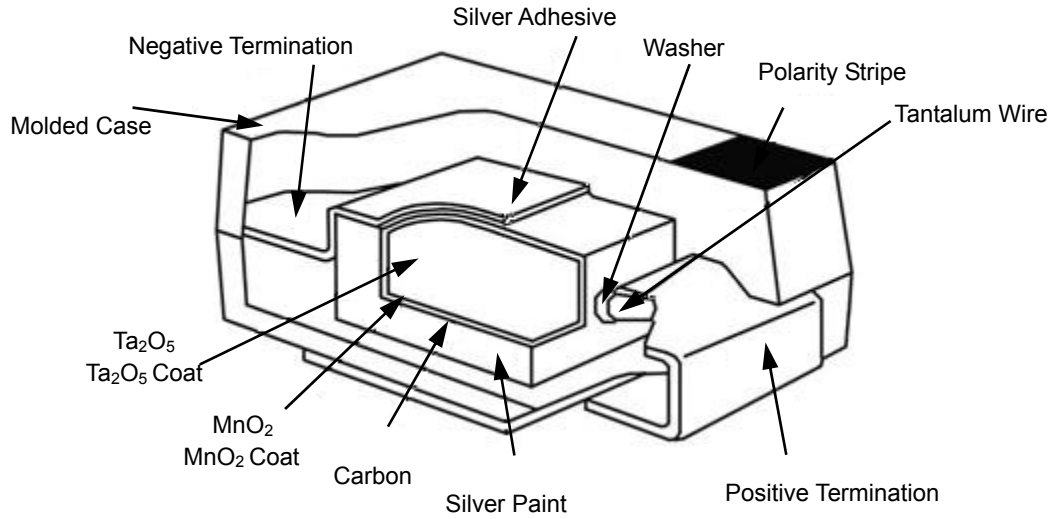
Item	SPEC									Test Condition
Operating Temp	-55°C~+125°C									
C <sub>R</sub> Range	0.10μF~680μF									25°C, 120Hz
C <sub>R</sub> Tolerance	±10% or ±20%									25°C, 120Hz
Rated Voltage (V <sub>R</sub> )	2.5V	4V	6.3V	10V	16V	20V	25V	35V	50V	85°C
Category Voltage (V <sub>C</sub> )	1.6V	2.5V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

## STANDARD C-V VALUE BY CASE CODE

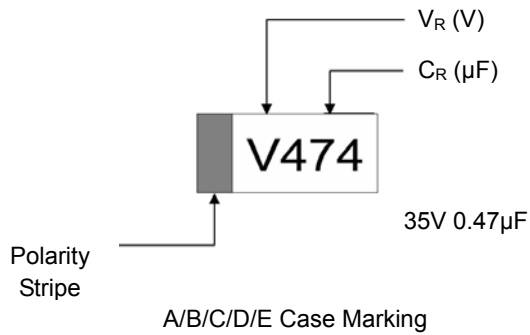
Rated Voltage (VR)		2.5	4	6.3	10	16	20	25	35	50
Voltage Code		e	G	J	A	C	D	E	V	T
CR (μF)	C Code	Case Code								
0.15	154									B
0.22	224									B/A
0.33	334							A	A	B/A
0.47	474							A	B/A	C/B/A
0.68	684						A	A	B/A	C/B/A
1.0	105			A	A	A	A	B/A	B/A	C/B
1.5	155			A	A	A	B/A	B/A	C/B	C/B
2.2	225		A	A	A	B/A	B/A	C/B/A	C/B/A	D/C/B
3.3	335		A	A	A	B/A	B/A	C/B/A	C/B	D/C/B
4.7	475		A	A	B/A	C/B/A	C/B/A	C/B/A	D/C/B	D
6.8	685		A	B/A	B/A	C/B/A	D/C/B/A	D/C/B	D/C	D
10	106	A	B/A	B/A	C/B/A	C/B/A	D/C/B	D/C/B	E/D/C	E/D
15	156	B/A	B/A	B/A	C/B/A	C/B	D/C	D/C/B	E/D	E
22	226	A	B/A	B/A	C/B/A	D/C/B/A	D/C/B	D/C	E/D	
33	336	A	C/B/A	C/B/A	D/C/B/A	D/C/B	D/C	E/D	E	
47	476	A	C/B/A	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					

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

## CONSTRUCTION



## MARKINGS



### 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 (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 (A/B/C/D/E Case)	106	156	226	336	476	686	107	157	227	337	477	687

# SPECIFICATIONS

## TC211 TYPE

Capacitance ( $\mu\text{F}$ )	Case	Part Number	DCL ( $\mu\text{A}$ ) +25°C Max.	DF (%) +25°C 120Hz Max.	ESR( $\Omega$ ) +25°C 100kHz Max.
2.5V, +85°C (1.6V @ +125°C)					
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	A	TC211A226@002□	0.6	6.0	4.0
33.0	A	TC211A336@002□	0.8	6.0	4.0
47.0	A	TC211A476@002□	1.2	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□	3.8	10.0	2.0
220.0	B	TC211B227@002□	5.5	18.0	2.0
4V, +85°C (2.5V @ +125°C)					
2.2	A	TC211A225@004□	0.5	6.0	8.0
3.3	A	TC211A335@004□	0.5	6.0	8.0
4.7	A	TC211A475@004□	0.5	6.0	8.0
6.8	A	TC211A685@004□	0.5	6.0	6.0
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□	0.9	6.0	4.0
22.0	B	TC211B226@004□	0.9	6.0	3.5
33.0	A	TC211A336@004□	1.3	6.0	4.0
33.0	B	TC211B336@004□	1.3	6.0	3.5
33.0	C	TC211C336@004□	1.3	6.0	1.8
47.0	A	TC211A476@004□	1.9	6.0	3.0
47.0	B	TC211B476@004□	1.9	6.0	3.0
47.0	C	TC211C476@004□	1.9	6.0	1.8
68.0	B	TC211B686@004□	2.7	6.0	3.5
68.0	C	TC211C686@004□	2.7	6.0	1.6
68.0	D	TC211D686@004□	2.7	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@004□	4.0	8.0	1.3
100.0	D	TC211D107@004□	4.0	8.0	0.8
150.0	B	TC211B157@004□	6.0	15.0	2.0
150.0	C	TC211C157@004□	6.0	8.0	1.2
150.0	D	TC211D157@004□	6.0	8.0	0.8
220.0	B	TC211B227@004□	8.8	18.0	0.5
220.0	C	TC211C227@004□	8.8	8.0	1.0
220.0	D	TC211D227@004□	8.8	8.0	0.8
330.0	B	TC211B337@004□	13.2	18.0	1.2
330.0	C	TC211C337@004□	13.2	8.0	1.2
330.0	D	TC211D337@004□	13.2	8.0	0.7
330.0	E	TC211E337@004□	13.2	8.0	0.8
470.0	E	TC211E477@004□	18.8	8.0	0.8
680.0	E	TC211E687@004□	27.2	8.0	0.5
6.3V, +85°C (4.0V @ +125°C)					
1.0	A	TC211A105@006□	0.5	6.0	14.0

Capacitance ( $\mu\text{F}$ )	Case	Part Number	DCL ( $\mu\text{A}$ ) +25°C Max.	DF (%) +25°C 120Hz Max.	ESR( $\Omega$ ) +25°C 100kHz Max.
1.5	A	TC211A155@006□	0.5	6.0	8.0
2.2	A	TC211A225@006□	0.5	6.0	8.0
3.3	A	TC211A335@006□	0.5	6.0	8.0
4.7	A	TC211A475@006□	0.5	6.0	6.0
6.8	A	TC211A685@006□	0.5	6.0	6.0
6.8	B	TC211B685@006□	0.5	6.0	3.5
10.0	A	TC211A106@006□	0.6	6.0	4.0
10.0	B	TC211B106@006□	0.6	6.0	3.5
15.0	A	TC211A156@006□	0.9	6.0	4.0
15.0	B	TC211B156@006□	0.9	6.0	3.5
22.0	A	TC211A226@006□	1.3	6.0	4.0
22.0	B	TC211B226@006□	1.3	6.0	3.5
33.0	A	TC211A336@006□	2.1	8.0	4.5
33.0	B	TC211B336@006□	2.1	6.0	3.0
33.0	C	TC211C336@006□	2.1	6.0	1.8
47.0	A	TC211A476@006□	3.0	8.0	3.5
47.0	B	TC211B476@006□	3.0	6.0	3.0
47.0	C	TC211C476@006□	3.0	6.0	1.6
68.0	B	TC211B686@006□	4.3	10.0	1.2
68.0	C	TC211C686@006□	4.3	6.0	1.2
68.0	D	TC211D686@006□	4.3	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@006□	6.3	8.0	1.2
100.0	D	TC211D107@006□	6.3	8.0	0.8
150.0	B	TC211B157@006□	9.5	15.0	1.0
150.0	C	TC211C157@006□	9.5	8.0	1.2
150.0	D	TC211D157@006□	9.5	8.0	0.8
220.0	B	TC211B227@006□	13.9	18.0	1.0
220.0	C	TC211C227@006□	13.9	8.0	1.2
220.0	D	TC211D227@006□	13.9	8.0	0.7
220.0	E	TC211E227@006□	13.9	8.0	0.5
330.0	D	TC211D337@006□	20.8	8.0	0.5
330.0	E	TC211E337@006□	20.8	8.0	0.5
470.0	D	TC211D477@006□	29.6	12.0	0.4
470.0	E	TC211E477@006□	29.6	10.0	0.5
10V, +85°C (6.3V @ +125°C)					
1.0	A	TC211A105@010□	0.5	4.0	13.0
1.5	A	TC211A155@010□	0.5	6.0	8.0
2.2	A	TC211A225@010□	0.5	6.0	8.0
3.3	A	TC211A335@010□	0.5	6.0	6.0
4.7	A	TC211A475@010□	0.5	6.0	6.0
4.7	B	TC211B475@010□	0.5	6.0	3.5
6.8	A	TC211A685@010□	0.7	6.0	6.0
6.8	B	TC211B685@010□	0.7	6.0	3.5
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@010□	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@010□	1.5	6.0	1.8

# SPECIFICATIONS

## TC211 TYPE

Capacitance ( $\mu$ F)	Case	Part Number	DCL ( $\mu$ A) +25 $^{\circ}$ C Max.	DF (%) +25 $^{\circ}$ C 120Hz Max.	ESR( $\Omega$ ) +25 $^{\circ}$ C 100kHz Max.	Capacitance ( $\mu$ F)	Case	Part Number	DCL ( $\mu$ A) +25 $^{\circ}$ C Max.	DF (%) +25 $^{\circ}$ C 120Hz Max.	ESR( $\Omega$ ) +25 $^{\circ}$ C 100kHz Max.
22.0	A	TC211A226 $\odot$ 010 $\square$	2.2	8.0	4.0	47.0	C	TC211C476 $\odot$ 016 $\square$	7.5	6.0	1.2
22.0	B	TC211B226 $\odot$ 010 $\square$	2.2	6.0	3.0	47.0	D	TC211D476 $\odot$ 016 $\square$	7.5	6.0	0.8
22.0	C	TC211C226 $\odot$ 010 $\square$	2.2	6.0	1.8	68.0	D	TC211D686 $\odot$ 016 $\square$	10.8	6.0	0.8
33.0	A	TC211A336 $\odot$ 010 $\square$	3.3	15.0	6.0	100.0	C	TC211C107 $\odot$ 016 $\square$	16.0	10.0	1.0
33.0	B	TC211B336 $\odot$ 010 $\square$	3.3	6.0	3.5	100.0	D	TC211D107 $\odot$ 016 $\square$	16.0	8.0	0.7
33.0	C	TC211C336 $\odot$ 010 $\square$	3.3	6.0	1.6	150.0	D	TC211D157 $\odot$ 016 $\square$	24.0	12.0	0.7
33.0	D	TC211D336 $\odot$ 010 $\square$	3.3	6.0	0.8	150.0	E	TC211E157 $\odot$ 016 $\square$	24.0	8.0	0.5
47.0	A	TC211A476 $\odot$ 010 $\square$	4.7	15.0	4.0	220.0	D	TC211D227 $\odot$ 016 $\square$	35.2	15.0	0.9
47.0	B	TC211B476 $\odot$ 010 $\square$	4.7	6.0	1.0	220.0	E	TC211E227 $\odot$ 016 $\square$	35.2	10.0	0.5
47.0	C	TC211C476 $\odot$ 010 $\square$	4.7	6.0	1.2	330.0	E	TC211E337 $\odot$ 016 $\square$	52.8	10.0	0.5
47.0	D	TC211D476 $\odot$ 010 $\square$	4.7	6.0	0.8	20V, +85 $^{\circ}$ C (13V @ +125 $^{\circ}$ C)					
68.0	B	TC211B686 $\odot$ 010 $\square$	6.8	10.0	3.0	0.68	A	TC211A684 $\odot$ 020 $\square$	0.5	4.0	12.0
68.0	C	TC211C686 $\odot$ 010 $\square$	6.8	6.0	1.2	1.0	A	TC211A105 $\odot$ 020 $\square$	0.5	4.0	10.0
68.0	D	TC211D686 $\odot$ 010 $\square$	6.8	6.0	0.8	1.5	A	TC211A155 $\odot$ 020 $\square$	0.5	6.0	8.0
100.0	B	TC211B107 $\odot$ 010 $\square$	10.0	15.0	1.5	1.5	B	TC211B155 $\odot$ 020 $\square$	0.5	6.0	5.0
100.0	C	TC211C107 $\odot$ 010 $\square$	10.0	8.0	1.2	2.2	A	TC211A225 $\odot$ 020 $\square$	0.5	6.0	7.0
100.0	D	TC211D107 $\odot$ 010 $\square$	10.0	8.0	0.7	2.2	B	TC211B225 $\odot$ 020 $\square$	0.5	6.0	3.5
150.0	C	TC211C157 $\odot$ 010 $\square$	15.0	10.0	0.9	3.3	A	TC211A335 $\odot$ 020 $\square$	0.7	6.0	7.0
150.0	D	TC211D157 $\odot$ 010 $\square$	15.0	8.0	0.7	3.3	B	TC211B335 $\odot$ 020 $\square$	0.7	6.0	3.5
150.0	E	TC211E157 $\odot$ 010 $\square$	15.0	8.0	0.5	4.7	A	TC211A475 $\odot$ 020 $\square$	0.9	6.0	4.0
220.0	D	TC211D227 $\odot$ 010 $\square$	22.0	8.0	0.5	4.7	B	TC211B475 $\odot$ 020 $\square$	0.9	6.0	3.5
220.0	E	TC211E227 $\odot$ 010 $\square$	22.0	8.0	0.5	4.7	C	TC211C475 $\odot$ 020 $\square$	0.9	6.0	2.4
330.0	D	TC211D337 $\odot$ 010 $\square$	33.0	10.0	0.5	6.8	A	TC211A685 $\odot$ 020 $\square$	1.4	8.0	6.0
330.0	E	TC211E337 $\odot$ 010 $\square$	33.0	10.0	0.5	6.8	B	TC211B685 $\odot$ 020 $\square$	1.4	6.0	3.5
470.0	E	TC211E477 $\odot$ 010 $\square$	47.0	10.0	0.5	6.8	C	TC211C685 $\odot$ 020 $\square$	1.4	6.0	2.0
16V, +85 $^{\circ}$ C (10V @ +125 $^{\circ}$ C)						6.8	D	TC211D685 $\odot$ 020 $\square$	1.4	6.0	1.9
1.0	A	TC211A105 $\odot$ 016 $\square$	0.5	4.0	10.0	10.0	B	TC211B106 $\odot$ 020 $\square$	2.0	6.0	3.0
1.5	A	TC211A155 $\odot$ 016 $\square$	0.5	6.0	8.0	10.0	C	TC211C106 $\odot$ 020 $\square$	2.0	6.0	1.8
2.2	A	TC211A225 $\odot$ 016 $\square$	0.5	6.0	6.0	10.0	D	TC211D106 $\odot$ 020 $\square$	2.0	6.0	1.0
2.2	B	TC211B225 $\odot$ 016 $\square$	0.5	6.0	4.0	15.0	C	TC211C156 $\odot$ 020 $\square$	3.0	6.0	1.7
3.3	A	TC211A335 $\odot$ 016 $\square$	0.52	6.0	6.0	15.0	D	TC211D156 $\odot$ 020 $\square$	3.0	6.0	1.0
3.3	B	TC211B335 $\odot$ 016 $\square$	0.5	6.0	3.5	22.0	B	TC211B226 $\odot$ 020 $\square$	4.4	8.0	4.0
4.7	A	TC211A475 $\odot$ 016 $\square$	0.8	6.0	6.0	22.0	C	TC211C226 $\odot$ 020 $\square$	4.4	6.0	1.2
4.7	B	TC211B475 $\odot$ 016 $\square$	0.8	6.0	3.5	22.0	D	TC211D226 $\odot$ 020 $\square$	4.4	6.0	0.8
4.7	C	TC211C475 $\odot$ 016 $\square$	0.8	6.0	2.4	33.0	C	TC211C336 $\odot$ 020 $\square$	6.6	6.0	1.2
6.8	A	TC211A685 $\odot$ 016 $\square$	1.1	6.0	7.0	33.0	D	TC211D336 $\odot$ 020 $\square$	6.6	6.0	0.8
6.8	B	TC211B685 $\odot$ 016 $\square$	1.1	6.0	3.5	47.0	C	TC211C476 $\odot$ 020 $\square$	9.4	10.0	1.0
6.8	C	TC211C685 $\odot$ 016 $\square$	1.1	6.0	2.0	47.0	D	TC211D476 $\odot$ 020 $\square$	9.4	6.0	0.8
10.0	A	TC211A106 $\odot$ 016 $\square$	1.6	8.0	7.0	47.0	E	TC211E476 $\odot$ 020 $\square$	9.4	6.0	0.8
10.0	B	TC211B106 $\odot$ 016 $\square$	1.6	6.0	2.8	68.0	D	TC211D686 $\odot$ 020 $\square$	13.6	6.0	0.8
10.0	C	TC211C106 $\odot$ 016 $\square$	1.6	6.0	1.8	68.0	E	TC211E686 $\odot$ 020 $\square$	13.6	6.0	0.8
15.0	B	TC211B156 $\odot$ 016 $\square$	2.4	6.0	3.0	100.0	D	TC211D107 $\odot$ 020 $\square$	20.0	8.0	0.6
15.0	C	TC211C156 $\odot$ 016 $\square$	2.4	6.0	1.8	100.0	E	TC211E107 $\odot$ 020 $\square$	20.0	8.0	0.5
22.0	A	TC211A226 $\odot$ 016 $\square$	3.5	15.0	4.0	150.0	E	TC211E157 $\odot$ 020 $\square$	30.0	8.0	0.5
22.0	B	TC211B226 $\odot$ 016 $\square$	3.5	8.0	2.2	25V, +85 $^{\circ}$ C (16V @ +125 $^{\circ}$ C)					
22.0	C	TC211C226 $\odot$ 016 $\square$	3.5	6.0	1.6	0.33	A	TC211A334 $\odot$ 025 $\square$	0.5	4.0	15.0
22.0	D	TC211D226 $\odot$ 016 $\square$	3.5	6.0	0.8	0.47	A	TC211A474 $\odot$ 025 $\square$	0.5	4.0	14.0
33.0	B	TC211B336 $\odot$ 016 $\square$	5.3	8.0	2.0	0.68	A	TC211A684 $\odot$ 025 $\square$	0.5	4.0	10.0
33.0	C	TC211C336 $\odot$ 016 $\square$	5.3	6.0	1.2	1.0	A	TC211A105 $\odot$ 025 $\square$	0.5	4.0	8.0
33.0	D	TC211D336 $\odot$ 016 $\square$	5.3	6.0	0.8	1.0	B	TC211B105 $\odot$ 025 $\square$	0.5	4.0	5.0
47.0	B	TC211B476 $\odot$ 016 $\square$	7.5	18.0	1.0	1.5	A	TC211A155 $\odot$ 025 $\square$	0.5	6.0	10.0

# SPECIFICATIONS

## TC211 TYPE

Capacitance ( $\mu\text{F}$ )	Case	Part Number	DCL ( $\mu\text{A}$ ) +25 $^{\circ}\text{C}$ Max.	DF (%) +25 $^{\circ}\text{C}$ 120Hz Max.	ESR( $\Omega$ ) +25 $^{\circ}\text{C}$ 100kHz Max.
1.5	B	TC211B155 $\odot$ 025□	0.5	6.0	5.0
2.2	A	TC211A225 $\odot$ 025□	0.6	6.0	6.0
2.2	B	TC211B225 $\odot$ 025□	0.6	6.0	4.5
2.2	C	TC211C225 $\odot$ 025□	0.6	6.0	3.5
3.3	A	TC211A335 $\odot$ 025□	0.8	6.0	7.0
3.3	B	TC211B335 $\odot$ 025□	0.8	6.0	3.5
3.3	C	TC211C335 $\odot$ 025□	0.8	6.0	2.5
4.7	A	TC211A475 $\odot$ 025□	1.2	8.0	6.0
4.7	B	TC211B475 $\odot$ 025□	1.2	6.0	2.0
4.7	C	TC211C475 $\odot$ 025□	1.2	6.0	2.4
6.8	B	TC211B685 $\odot$ 025□	1.7	6.0	3.0
6.8	C	TC211C685 $\odot$ 025□	1.7	6.0	1.9
6.8	D	TC211D685 $\odot$ 025□	1.7	6.0	1.2
10.0	B	TC211B106 $\odot$ 025□	2.5	6.0	3.0
10.0	C	TC211C106 $\odot$ 025□	2.5	6.0	1.5
10.0	D	TC211D106 $\odot$ 025□	2.5	6.0	1.0
15.0	B	TC211B156 $\odot$ 025□	3.8	8.0	4.0
15.0	C	TC211C156 $\odot$ 025□	3.8	6.0	1.5
15.0	D	TC211D156 $\odot$ 025□	3.8	6.0	1.0
22.0	C	TC211C226 $\odot$ 025□	5.5	6.0	1.4
22.0	D	TC211D226 $\odot$ 025□	5.5	6.0	0.8
33.0	D	TC211D336 $\odot$ 025□	8.3	6.0	0.8
33.0	E	TC211E336 $\odot$ 025□	8.3	6.0	0.7
47.0	D	TC211D476 $\odot$ 025□	11.7	6.0	0.8
47.0	E	TC211E476 $\odot$ 025□	11.7	6.0	0.7
68.0	E	TC211E686 $\odot$ 025□	17.0	6.0	0.7
100.0	D	TC211D107 $\odot$ 025□	25.0	10.0	1.2
35V, +85 $^{\circ}\text{C}$ (20V @ +125 $^{\circ}\text{C}$ )					
0.33	A	TC211A334 $\odot$ 035□	0.5	4.0	15.0
0.47	A	TC211A474 $\odot$ 035□	0.5	4.0	14.0
0.47	B	TC211B474 $\odot$ 035□	0.5	4.0	8.0
0.68	A	TC211A684 $\odot$ 035□	0.5	4.0	10.0
0.68	B	TC211B684 $\odot$ 035□	0.5	4.0	6.5
1.0	A	TC211A105 $\odot$ 035□	0.5	4.0	10.0
1.0	B	TC211B105 $\odot$ 035□	0.5	4.0	5.0
1.5	B	TC211B155 $\odot$ 035□	0.5	6.0	5.0
1.5	C	TC211C155 $\odot$ 035□	0.5	6.0	4.5
2.2	A	TC211A225 $\odot$ 035□	0.8	6.0	6.0
2.2	B	TC211B225 $\odot$ 035□	0.8	6.0	4.0
2.2	C	TC211C225 $\odot$ 035□	0.8	6.0	3.5
3.3	B	TC211B335 $\odot$ 035□	1.2	6.0	3.5

Capacitance ( $\mu\text{F}$ )	Case	Part Number	DCL ( $\mu\text{A}$ ) +25 $^{\circ}\text{C}$ Max.	DF (%) +25 $^{\circ}\text{C}$ 120Hz Max.	ESR( $\Omega$ ) +25 $^{\circ}\text{C}$ 100kHz Max.
3.3	C	TC211C335 $\odot$ 035□	1.2	6.0	2.5
4.7	B	TC211B475 $\odot$ 035□	1.6	6.0	3.0
4.7	C	TC211C475 $\odot$ 035□	1.6	6.0	2.5
4.7	D	TC211D475 $\odot$ 035□	1.6	6.0	1.5
6.8	C	TC211C685 $\odot$ 035□	2.4	6.0	2.0
6.8	D	TC211D685 $\odot$ 035□	2.4	6.0	1.5
10.0	C	TC211C106 $\odot$ 035□	3.5	6.0	2.0
10.0	D	TC211D106 $\odot$ 035□	3.5	6.0	1.0
10.0	E	TC211E106 $\odot$ 035□	3.5	6.0	1.0
15.0	D	TC211D156 $\odot$ 035□	5.3	6.0	1.0
15.0	E	TC211E156 $\odot$ 035□	5.3	6.0	0.9
22.0	D	TC211D226 $\odot$ 035□	7.7	6.0	0.8
22.0	E	TC211E226 $\odot$ 035□	7.7	6.0	0.7
33.0	E	TC211E336 $\odot$ 035□	11.0	6.0	0.6
47.0	E	TC211E476 $\odot$ 035□	16.5	8.0	0.6
50V, +85 $^{\circ}\text{C}$ (32V @ +125 $^{\circ}\text{C}$ )					
0.15	B	TC211B154 $\odot$ 050□	0.5	4.0	16.0
0.22	A	TC211A224 $\odot$ 050□	0.5	4.0	18.0
0.22	B	TC211B224 $\odot$ 050□	0.5	4.0	14.0
0.33	A	TC211A334 $\odot$ 050□	0.5	4.0	15.0
0.33	B	TC211B334 $\odot$ 050□	0.5	4.0	10.0
0.47	A	TC211A474 $\odot$ 050□	0.5	4.0	12.0
0.47	B	TC211B474 $\odot$ 050□	0.5	4.0	9.0
0.47	C	TC211C474 $\odot$ 050□	0.5	4.0	8.0
0.68	A	TC211A684 $\odot$ 050□	0.5	4.0	10.0
0.68	B	TC211B684 $\odot$ 050□	0.5	4.0	8.0
0.68	C	TC211C684 $\odot$ 050□	0.5	4.0	7.0
1.0	B	TC211B105 $\odot$ 050□	0.5	6.0	6.0
1.0	C	TC211C105 $\odot$ 050□	0.5	4.0	5.5
1.5	B	TC211B155 $\odot$ 050□	0.8	6.0	4.5
1.5	C	TC211C155 $\odot$ 050□	0.8	6.0	3.5
2.2	B	TC211B225 $\odot$ 050□	1.1	6.0	2.0
2.2	C	TC211C225 $\odot$ 050□	1.1	6.0	3.5
2.2	D	TC211D225 $\odot$ 050□	1.1	6.0	2.5
3.3	B	TC211B335 $\odot$ 050□	1.7	6.0	5.0
3.3	C	TC211C335 $\odot$ 050□	1.7	6.0	3.0
3.3	D	TC211D335 $\odot$ 050□	1.7	6.0	2.0
4.7	D	TC211D475 $\odot$ 050□	2.4	6.0	1.5
6.8	D	TC211D685 $\odot$ 050□	3.4	6.0	1.2
10.0	D	TC211D106 $\odot$ 050□	5.0	6.0	1.0
10.0	E	TC211E106 $\odot$ 050□	5.0	6.0	0.7
15.0	E	TC211E156 $\odot$ 050□	7.5	6.0	0.7

# SPECIFICATIONS

## TC212 TYPE

Capacitance ( $\mu$ F)	Case	Part Number	DCL ( $\mu$ A) +25°C Max.	DF (%) +25°C 120Hz Max.	ESR( $\Omega$ ) +25°C 100kHz Max.
2.5V, +85°C (1.6V @ +125°C)					
10.0	A	TC212A106 $\odot$ 002 $\square$	0.5	6.0	4.0
15.0	A	TC212A156 $\odot$ 002 $\square$	0.5	6.0	4.0
15.0	B	TC212B156 $\odot$ 002 $\square$	0.5	6.0	3.0
22.0	A	TC212A226 $\odot$ 002 $\square$	0.6	6.0	3.0
33.0	A	TC212A336 $\odot$ 002 $\square$	0.8	6.0	3.0
47.0	A	TC212A476 $\odot$ 002 $\square$	1.2	10.0	3.0
68.0	A	TC212A686 $\odot$ 002 $\square$	1.7	10.0	2.5
68.0	B	TC212B686 $\odot$ 002 $\square$	1.7	6.0	1.8
100.0	A	TC212A107 $\odot$ 002 $\square$	2.5	20.0	2.0
100.0	B	TC212B107 $\odot$ 002 $\square$	2.5	8.0	1.0
150.0	B	TC212B157 $\odot$ 002 $\square$	3.8	10.0	1.5
220.0	B	TC212B227 $\odot$ 002 $\square$	5.5	18.0	1.5
4V, +85°C (2.5V @ +125°C)					
2.2	A	TC212A225 $\odot$ 004 $\square$	0.5	6.0	6.0
3.3	A	TC212A335 $\odot$ 004 $\square$	0.5	6.0	6.0
4.7	A	TC212A475 $\odot$ 004 $\square$	0.5	6.0	5.0
6.8	A	TC212A685 $\odot$ 004 $\square$	0.5	6.0	4.0
10.0	A	TC212A106 $\odot$ 004 $\square$	0.5	6.0	3.0
10.0	B	TC212B106 $\odot$ 004 $\square$	0.5	6.0	1.5
15.0	A	TC212A156 $\odot$ 004 $\square$	0.6	6.0	1.5
15.0	B	TC212B156 $\odot$ 004 $\square$	0.6	6.0	1.2
22.0	A	TC212A226 $\odot$ 004 $\square$	0.9	6.0	1.5
22.0	B	TC212B226 $\odot$ 004 $\square$	0.9	6.0	0.6
33.0	A	TC212A336 $\odot$ 004 $\square$	1.3	6.0	2.5
33.0	B	TC212B336 $\odot$ 004 $\square$	1.3	6.0	0.5
33.0	C	TC212C336 $\odot$ 004 $\square$	1.3	6.0	0.8
47.0	A	TC212A476 $\odot$ 004 $\square$	1.9	6.0	2.0
47.0	B	TC212B476 $\odot$ 004 $\square$	1.9	6.0	0.8
47.0	C	TC212C476 $\odot$ 004 $\square$	1.9	6.0	1.0
68.0	B	TC212B686 $\odot$ 004 $\square$	2.7	6.0	2.5
68.0	C	TC212C686 $\odot$ 004 $\square$	2.7	6.0	0.5
68.0	D	TC212D686 $\odot$ 004 $\square$	2.7	6.0	0.5
100.0	A	TC212A107 $\odot$ 004 $\square$	4.0	18.0	3.0
100.0	B	TC212B107 $\odot$ 004 $\square$	4.0	8.0	1.0
100.0	C	TC212C107 $\odot$ 004 $\square$	4.0	8.0	0.35
100.0	D	TC212D107 $\odot$ 004 $\square$	4.0	8.0	0.2
150.0	B	TC212B157 $\odot$ 004 $\square$	6.0	15.0	1.0
150.0	C	TC212C157 $\odot$ 004 $\square$	6.0	8.0	0.3
150.0	D	TC212D157 $\odot$ 004 $\square$	6.0	8.0	0.2
220.0	B	TC212B227 $\odot$ 004 $\square$	8.8	18.0	0.4
220.0	C	TC212C227 $\odot$ 004 $\square$	8.8	8.0	0.5
220.0	D	TC212D227 $\odot$ 004 $\square$	8.8	8.0	0.3
330.0	B	TC212B337 $\odot$ 004 $\square$	13.2	18.0	0.7
330.0	C	TC212C337 $\odot$ 004 $\square$	13.2	8.0	0.8
330.0	D	TC212D337 $\odot$ 004 $\square$	13.2	8.0	0.2
330.0	E	TC212E337 $\odot$ 004 $\square$	13.2	8.0	0.2
470.0	E	TC212E477 $\odot$ 004 $\square$	18.8	8.0	0.2
680.0	E	TC212E687 $\odot$ 004 $\square$	27.2	8.0	0.2
6.3V, +85°C (4.0V @ +125°C)					

Capacitance ( $\mu$ F)	Case	Part Number	DCL ( $\mu$ A) +25°C Max.	DF (%) +25°C 120Hz Max.	ESR( $\Omega$ ) +25°C 100kHz Max.
1.0	A	TC212A105 $\odot$ 006 $\square$	0.5	6.0	10.0
1.5	A	TC212A155 $\odot$ 006 $\square$	0.5	6.0	6.0
2.2	A	TC212A225 $\odot$ 006 $\square$	0.5	6.0	6.0
3.3	A	TC212A335 $\odot$ 006 $\square$	0.5	6.0	6.0
4.7	A	TC212A475 $\odot$ 006 $\square$	0.5	6.0	4.0
6.8	A	TC212A685 $\odot$ 006 $\square$	0.5	6.0	3.5
6.8	B	TC212B685 $\odot$ 006 $\square$	0.5	6.0	3.0
10.0	A	TC212A106 $\odot$ 006 $\square$	0.6	6.0	2.0
10.0	B	TC212B106 $\odot$ 006 $\square$	0.6	6.0	1.0
15.0	A	TC212A156 $\odot$ 006 $\square$	0.9	6.0	2.0
15.0	B	TC212B156 $\odot$ 006 $\square$	0.9	6.0	0.7
22.0	A	TC212A226 $\odot$ 006 $\square$	1.4	6.0	2.5
22.0	B	TC212B226 $\odot$ 006 $\square$	1.4	6.0	0.8
33.0	A	TC212A336 $\odot$ 006 $\square$	2.1	8.0	1.5
33.0	B	TC212B336 $\odot$ 006 $\square$	2.1	6.0	0.8
33.0	C	TC212C336 $\odot$ 006 $\square$	2.1	6.0	0.3
47.0	A	TC212A476 $\odot$ 006 $\square$	2.9	8.0	2.5
47.0	B	TC212B476 $\odot$ 006 $\square$	2.9	6.0	0.5
47.0	C	TC212C476 $\odot$ 006 $\square$	2.9	6.0	0.3
68.0	B	TC212B686 $\odot$ 006 $\square$	4.3	10.0	0.65
68.0	C	TC212C686 $\odot$ 006 $\square$	4.3	6.0	0.3
68.0	D	TC212D686 $\odot$ 006 $\square$	4.3	6.0	0.2
100.0	A	TC212A107 $\odot$ 006 $\square$	6.3	20.0	2.0
100.0	B	TC212B107 $\odot$ 006 $\square$	6.3	10.0	1.5
100.0	C	TC212C107 $\odot$ 006 $\square$	6.3	8.0	0.3
100.0	D	TC212D107 $\odot$ 006 $\square$	6.3	8.0	0.2
150.0	B	TC212B157 $\odot$ 006 $\square$	9.5	15.0	0.6
150.0	C	TC212C157 $\odot$ 006 $\square$	9.5	8.0	0.3
150.0	D	TC212D157 $\odot$ 006 $\square$	9.5	8.0	0.2
220.0	B	TC212B227 $\odot$ 006 $\square$	13.9	18.0	0.7
220.0	C	TC212C227 $\odot$ 006 $\square$	13.9	8.0	0.3
220.0	D	TC212D227 $\odot$ 006 $\square$	13.9	8.0	0.15
220.0	E	TC212E227 $\odot$ 006 $\square$	13.9	8.0	0.15
330.0	D	TC212D337 $\odot$ 006 $\square$	20.8	8.0	0.15
330.0	E	TC212E337 $\odot$ 006 $\square$	20.8	8.0	0.15
470.0	D	TC212D477 $\odot$ 006 $\square$	29.6	12.0	0.15
470.0	E	TC212E477 $\odot$ 006 $\square$	29.6	10.0	0.12
10V, +85°C (6.3V @ +125°C)					
1.0	A	TC212A105 $\odot$ 010 $\square$	0.5	4.0	8.0
1.5	A	TC212A155 $\odot$ 010 $\square$	0.5	6.0	6.0
2.2	A	TC212A225 $\odot$ 010 $\square$	0.5	6.0	6.0
3.3	A	TC212A335 $\odot$ 010 $\square$	0.5	6.0	4.0
4.7	A	TC212A475 $\odot$ 010 $\square$	0.5	6.0	3.0
4.7	B	TC212B475 $\odot$ 010 $\square$	0.5	6.0	1.5
6.8	A	TC212A685 $\odot$ 010 $\square$	0.7	6.0	3.0
6.8	B	TC212B685 $\odot$ 010 $\square$	0.7	6.0	1.2
10.0	A	TC212A106 $\odot$ 010 $\square$	1.0	6.0	1.8
10.0	B	TC212B106 $\odot$ 010 $\square$	1.0	6.0	0.8
10.0	C	TC212C106 $\odot$ 010 $\square$	1.0	6.0	0.6
15.0	A	TC212A156 $\odot$ 010 $\square$	1.5	6.0	4.0



# PECIFICATIONS

## TC212 TYPE

Capacitance ( $\mu\text{F}$ )	Case	Part Number	DCL ( $\mu\text{A}$ ) +25 $^{\circ}\text{C}$ Max.	DF (%) +25 $^{\circ}\text{C}$ 120Hz Max.	ESR( $\Omega$ ) +25 $^{\circ}\text{C}$ 100kHz Max.	Capacitance ( $\mu\text{F}$ )	Case	Part Number	DCL ( $\mu\text{A}$ ) +25 $^{\circ}\text{C}$ Max.	DF (%) +25 $^{\circ}\text{C}$ 120Hz Max.	ESR( $\Omega$ ) +25 $^{\circ}\text{C}$ 100kHz Max.
15.0	B	TC212B156 $\odot$ 010 $\square$	1.5	6.0	0.7	33.0	D	TC212D336 $\odot$ 016 $\square$	5.3	6.0	0.5
15.0	C	TC212C156 $\odot$ 010 $\square$	1.5	6.0	0.5	47.0	B	TC212B476 $\odot$ 016 $\square$	7.5	18.0	0.7
22.0	A	TC212A226 $\odot$ 010 $\square$	2.2	8.0	2.5	47.0	C	TC212C476 $\odot$ 016 $\square$	7.5	6.0	0.8
22.0	B	TC212B226 $\odot$ 010 $\square$	2.2	6.0	1.0	47.0	D	TC212D476 $\odot$ 016 $\square$	7.5	6.0	0.5
22.0	C	TC212C226 $\odot$ 010 $\square$	2.2	6.0	0.4	68.0	D	TC212D686 $\odot$ 016 $\square$	10.8	6.0	0.5
33.0	A	TC212A336 $\odot$ 010 $\square$	3.3	15.0	4.0	100.0	C	TC212C107 $\odot$ 016 $\square$	16.0	10.0	0.7
33.0	B	TC212B336 $\odot$ 010 $\square$	3.3	6.0	1.0	100.0	D	TC212D107 $\odot$ 016 $\square$	16.0	8.0	0.5
33.0	C	TC212C336 $\odot$ 010 $\square$	3.3	6.0	0.4	150.0	D	TC212D157 $\odot$ 016 $\square$	24.0	12.0	0.4
33.0	D	TC212D336 $\odot$ 010 $\square$	3.3	6.0	0.25	150.0	E	TC212E157 $\odot$ 016 $\square$	24.0	8.0	0.15
47.0	A	TC212A476 $\odot$ 010 $\square$	4.7	15.0	1.5	220.0	D	TC212D227 $\odot$ 016 $\square$	35.2	15.0	0.6
47.0	B	TC212B476 $\odot$ 010 $\square$	4.7	6.0	0.65	220.0	E	TC212E227 $\odot$ 016 $\square$	35.2	10.0	0.2
47.0	C	TC212C476 $\odot$ 010 $\square$	4.7	6.0	0.3	330.0	E	TC212E337 $\odot$ 016 $\square$	52.8	10.0	0.2
47.0	D	TC212D476 $\odot$ 010 $\square$	4.7	6.0	0.22	20V, +85 $^{\circ}\text{C}$ (13V @ +125 $^{\circ}\text{C}$ )					
68.0	B	TC212B686 $\odot$ 010 $\square$	6.8	10.0	1.5	0.68	A	TC212A684 $\odot$ 020 $\square$	0.5	4.0	10.0
68.0	C	TC212C686 $\odot$ 010 $\square$	6.8	6.0	0.3	1.0	A	TC212A105 $\odot$ 020 $\square$	0.5	4.0	8.0
68.0	D	TC212D686 $\odot$ 010 $\square$	6.8	6.0	0.2	1.5	A	TC212A155 $\odot$ 020 $\square$	0.5	6.0	4.5
100.0	B	TC212B107 $\odot$ 010 $\square$	10.0	15.0	1.0	1.5	B	TC212B155 $\odot$ 020 $\square$	0.5	6.0	1.5
100.0	C	TC212C107 $\odot$ 010 $\square$	10.0	8.0	0.3	2.2	A	TC212A225 $\odot$ 020 $\square$	0.5	6.0	4.0
100.0	D	TC212D107 $\odot$ 010 $\square$	10.0	8.0	0.15	2.2	B	TC212B225 $\odot$ 020 $\square$	0.5	6.0	3.0
150.0	C	TC212C157 $\odot$ 010 $\square$	15.0	10.0	0.7	3.3	A	TC212A335 $\odot$ 020 $\square$	0.7	6.0	6.0
150.0	D	TC212D157 $\odot$ 010 $\square$	15.0	8.0	0.15	3.3	B	TC212B335 $\odot$ 020 $\square$	0.7	6.0	2.5
150.0	E	TC212E157 $\odot$ 010 $\square$	15.0	8.0	0.15	4.7	A	TC212A475 $\odot$ 020 $\square$	0.9	6.0	3.5
220.0	D	TC212D227 $\odot$ 010 $\square$	22.0	8.0	0.15	4.7	B	TC212B475 $\odot$ 020 $\square$	0.9	6.0	2.5
220.0	E	TC212E227 $\odot$ 010 $\square$	22.0	8.0	0.15	4.7	C	TC212C475 $\odot$ 020 $\square$	0.9	6.0	1.2
330.0	D	TC212D337 $\odot$ 010 $\square$	33.0	10.0	0.15	6.8	A	TC212A685 $\odot$ 020 $\square$	1.4	8.0	3.0
330.0	E	TC212E337 $\odot$ 010 $\square$	33.0	10.0	0.2	6.8	B	TC212B685 $\odot$ 020 $\square$	1.4	6.0	2.5
470.0	E	TC212E477 $\odot$ 010 $\square$	47.0	10.0	0.2	6.8	C	TC212C685 $\odot$ 020 $\square$	1.4	6.0	1.2
16V, +85 $^{\circ}\text{C}$ (10V @ +125 $^{\circ}\text{C}$ )						6.8	D	TC212D685 $\odot$ 020 $\square$	1.4	6.0	0.8
1.0	A	TC212A105 $\odot$ 016 $\square$	0.5	4.0	8.0	10.0	B	TC212B106 $\odot$ 020 $\square$	2.0	6.0	2.0
1.5	A	TC212A155 $\odot$ 016 $\square$	0.5	6.0	6.0	10.0	C	TC212C106 $\odot$ 020 $\square$	2.0	6.0	1.2
2.2	A	TC212A225 $\odot$ 016 $\square$	0.5	6.0	4.0	10.0	D	TC212D106 $\odot$ 020 $\square$	2.0	6.0	0.8
2.2	B	TC212B225 $\odot$ 016 $\square$	0.5	6.0	3.0	15.0	C	TC212C156 $\odot$ 020 $\square$	3.0	6.0	1.2
3.3	A	TC212A335 $\odot$ 016 $\square$	0.5	6.0	5.0	15.0	D	TC212D156 $\odot$ 020 $\square$	3.0	6.0	0.8
3.3	B	TC212B335 $\odot$ 016 $\square$	0.5	6.0	2.5	22.0	B	TC212B226 $\odot$ 020 $\square$	4.4	8.0	3.0
4.7	A	TC212A475 $\odot$ 016 $\square$	0.8	6.0	5.0	22.0	C	TC212C226 $\odot$ 020 $\square$	4.4	6.0	0.4
4.7	B	TC212B475 $\odot$ 016 $\square$	0.8	6.0	2.5	22.0	D	TC212D226 $\odot$ 020 $\square$	4.4	6.0	0.5
4.7	C	TC212C475 $\odot$ 016 $\square$	0.8	6.0	1.5	33.0	C	TC212C336 $\odot$ 020 $\square$	6.6	6.0	0.6
6.8	A	TC212A685 $\odot$ 016 $\square$	1.1	6.0	5.0	33.0	D	TC212D336 $\odot$ 020 $\square$	6.6	6.0	0.4
6.8	B	TC212B685 $\odot$ 016 $\square$	1.1	6.0	2.5	47.0	C	TC212C476 $\odot$ 020 $\square$	9.4	10.0	0.8
6.8	C	TC212C685 $\odot$ 016 $\square$	1.1	6.0	1.0	47.0	D	TC212D476 $\odot$ 020 $\square$	9.4	6.0	0.6
10.0	A	TC212A106 $\odot$ 016 $\square$	1.6	8.0	3.0	47.0	E	TC212E476 $\odot$ 020 $\square$	9.4	6.0	0.3
10.0	B	TC212B106 $\odot$ 016 $\square$	1.6	6.0	0.8	68.0	D	TC212D686 $\odot$ 020 $\square$	13.6	6.0	0.4
10.0	C	TC212C106 $\odot$ 016 $\square$	1.6	6.0	1.5	68.0	E	TC212E686 $\odot$ 020 $\square$	13.6	6.0	0.3
15.0	B	TC212B156 $\odot$ 016 $\square$	2.4	6.0	2.0	100.0	D	TC212D107 $\odot$ 020 $\square$	20.0	8.0	0.2
15.0	C	TC212C156 $\odot$ 016 $\square$	2.4	6.0	1.2	100.0	E	TC212E107 $\odot$ 020 $\square$	20.0	8.0	0.2
22.0	A	TC212A226 $\odot$ 016 $\square$	3.5	15.0	2.0	150.0	E	TC212E157 $\odot$ 020 $\square$	30.0	8.0	0.2
22.0	B	TC212B226 $\odot$ 016 $\square$	3.5	8.0	1.5	25V, +85 $^{\circ}\text{C}$ (16V @ +125 $^{\circ}\text{C}$ )					
22.0	C	TC212C226 $\odot$ 016 $\square$	3.5	6.0	1.2	0.33	A	TC212A334 $\odot$ 025 $\square$	0.5	4.0	12.0
22.0	D	TC212D226 $\odot$ 016 $\square$	3.5	6.0	0.6	0.47	A	TC212A474 $\odot$ 025 $\square$	0.5	4.0	10.0
33.0	B	TC212B336 $\odot$ 016 $\square$	5.3	8.0	1.0	0.68	A	TC212A684 $\odot$ 025 $\square$	0.5	4.0	6.0
33.0	C	TC212C336 $\odot$ 016 $\square$	5.3	6.0	1.0	1.0	A	TC212A105 $\odot$ 025 $\square$	0.5	4.0	6.0



# SPECIFICATIONS

## TC212 TYPE

Capacitance ( $\mu$ F)	Case	Part Number	DCL ( $\mu$ A) +25 $^{\circ}$ C Max.	DF (%) +25 $^{\circ}$ C 120Hz Max.	ESR( $\Omega$ ) +25 $^{\circ}$ C 100kHz Max.	Capacitance ( $\mu$ F)	Case	Part Number	DCL ( $\mu$ A) +25 $^{\circ}$ C Max.	DF (%) +25 $^{\circ}$ C 120Hz Max.	ESR( $\Omega$ ) +25 $^{\circ}$ C 100kHz Max.
1.0	B	TC212B105 $\odot$ 025□	0.5	4.0	4.0	3.3	B	TC212B335 $\odot$ 035□	1.2	6.0	3.0
1.5	A	TC212A155 $\odot$ 025□	0.5	6.0	5.0	3.3	C	TC212C335 $\odot$ 035□	1.2	6.0	2.0
1.5	B	TC212B155 $\odot$ 025□	0.5	6.0	3.5	4.7	B	TC212B475 $\odot$ 035□	1.6	6.0	2.0
2.2	A	TC212A225 $\odot$ 025□	0.6	6.0	4.0	4.7	C	TC212C475 $\odot$ 035□	1.6	6.0	2.0
2.2	B	TC212B225 $\odot$ 025□	0.6	6.0	3.0	4.7	D	TC212D475 $\odot$ 035□	1.6	6.0	1.0
2.2	C	TC212C225 $\odot$ 025□	0.6	6.0	2.0	6.8	C	TC212C685 $\odot$ 035□	2.4	6.0	1.2
3.3	A	TC212A335 $\odot$ 025□	0.8	6.0	3.0	6.8	D	TC212D685 $\odot$ 035□	2.4	6.0	0.8
3.3	B	TC212B335 $\odot$ 025□	0.8	6.0	2.5	10.0	C	TC212C106 $\odot$ 035□	3.5	6.0	1.5
3.3	C	TC212C335 $\odot$ 025□	0.8	6.0	2.0	10.0	D	TC212D106 $\odot$ 035□	3.5	6.0	0.6
4.7	A	TC212A475 $\odot$ 025□	1.2	8.0	3.0	10.0	E	TC212E106 $\odot$ 035□	3.5	6.0	0.6
4.7	B	TC212B475 $\odot$ 025□	1.2	6.0	1.0	15.0	D	TC212D156 $\odot$ 035□	5.25	6.0	0.8
4.7	C	TC212C475 $\odot$ 025□	1.2	6.0	0.6	15.0	E	TC212E156 $\odot$ 035□	5.3	6.0	0.6
6.8	B	TC212B685 $\odot$ 025□	1.7	6.0	1.2	22.0	D	TC212D226 $\odot$ 035□	7.7	6.0	0.6
6.8	C	TC212C685 $\odot$ 025□	1.7	6.0	0.8	22.0	E	TC212E226 $\odot$ 035□	7.7	6.0	0.3
6.8	D	TC212D685 $\odot$ 025□	1.7	6.0	0.5	33.0	E	TC212E336 $\odot$ 035□	11.0	6.0	0.5
10.0	B	TC212B106 $\odot$ 025□	2.5	6.0	2.0	47.0	E	TC212E476 $\odot$ 035□	16.5	8.0	0.5
10.0	C	TC212C106 $\odot$ 025□	2.5	6.0	1.4	50V, +85 $^{\circ}$ C (32V @ +125 $^{\circ}$ C)					
10.0	D	TC212D106 $\odot$ 025□	2.5	6.0	0.8	0.15	B	TC212B154 $\odot$ 050□	0.5	4.0	12.0
15.0	B	TC212B156 $\odot$ 025□	3.8	8.0	3.0	0.22	A	TC212A224 $\odot$ 050□	0.5	4.0	15.0
15.0	C	TC212C156 $\odot$ 025□	3.8	6.0	1.2	0.22	B	TC212B224 $\odot$ 050□	0.5	4.0	12.0
15.0	D	TC212D156 $\odot$ 025□	3.8	6.0	0.8	0.33	A	TC212A334 $\odot$ 050□	0.5	4.0	12.0
22.0	C	TC212C226 $\odot$ 025□	5.5	6.0	1.0	0.33	B	TC212B334 $\odot$ 050□	0.5	4.0	8.0
22.0	D	TC212D226 $\odot$ 025□	5.5	6.0	0.6	0.47	A	TC212A474 $\odot$ 050□	0.5	4.0	8.0
33.0	D	TC212D336 $\odot$ 025□	8.3	6.0	0.6	0.47	B	TC212B474 $\odot$ 050□	0.5	4.0	6.0
33.0	E	TC212E336 $\odot$ 025□	8.3	6.0	0.5	0.47	C	TC212C474 $\odot$ 050□	0.5	4.0	5.0
47.0	D	TC212D476 $\odot$ 025□	11.7	6.0	0.4	0.68	A	TC212A684 $\odot$ 050□	0.5	4.0	8.0
47.0	E	TC212E476 $\odot$ 025□	11.7	6.0	0.4	0.68	B	TC212B684 $\odot$ 050□	0.5	4.0	5.0
68.0	E	TC212E686 $\odot$ 025□	17.0	6.0	0.3	0.68	C	TC212C684 $\odot$ 050□	0.5	4.0	4.0
100.0	D	TC212D107 $\odot$ 025□	25.0	10.0	0.7	1.0	B	TC212B105 $\odot$ 050□	0.5	6.0	4.0
35V, +85 $^{\circ}$ C (20V @ +125 $^{\circ}$ C)						1.0	C	TC212C105 $\odot$ 050□	0.5	4.0	3.5
0.33	A	TC212A334 $\odot$ 035□	0.5	4.0	12.0	1.5	B	TC212B155 $\odot$ 050□	0.8	6.0	3.5
0.47	A	TC212A474 $\odot$ 035□	0.5	4.0	10.0	1.5	C	TC212C155 $\odot$ 050□	0.8	6.0	2.5
0.47	B	TC212B474 $\odot$ 035□	0.5	4.0	6.0	2.2	B	TC212B225 $\odot$ 050□	1.1	6.0	1.5
0.68	A	TC212A684 $\odot$ 035□	0.5	4.0	6.0	2.2	C	TC212C225 $\odot$ 050□	1.1	6.0	3.0
0.68	B	TC212B684 $\odot$ 035□	0.5	4.0	6.0	2.2	D	TC212D225 $\odot$ 050□	1.1	6.0	2.0
1.0	A	TC212A105 $\odot$ 035□	0.5	4.0	8.0	3.3	B	TC212B335 $\odot$ 050□	1.7	6.0	3.0
1.0	B	TC212B105 $\odot$ 035□	0.5	4.0	2.0	3.3	C	TC212C335 $\odot$ 050□	1.7	6.0	2.0
1.5	B	TC212B155 $\odot$ 035□	0.5	6.0	4.0	3.3	D	TC212D335 $\odot$ 050□	1.7	6.0	1.0
1.5	C	TC212C155 $\odot$ 035□	0.5	6.0	3.0	4.7	D	TC212D475 $\odot$ 050□	2.4	6.0	0.8
2.2	A	TC212A225 $\odot$ 035□	0.8	6.0	3.0	6.8	D	TC212D685 $\odot$ 050□	3.4	6.0	0.7
2.2	B	TC212B225 $\odot$ 035□	0.8	6.0	3.0	10.0	D	TC212D106 $\odot$ 050□	5.0	6.0	0.7
2.2	C	TC212C225 $\odot$ 035□	0.8	6.0	2.5	10.0	E	TC212E106 $\odot$ 050□	5.0	6.0	0.4
						15.0	E	TC212E156 $\odot$ 050□	7.5	6.0	0.4

# SPECIFICATIONS

## ATC214 TYPE

Capacitance ( $\mu$ F)	Case	Part Number	DCL ( $\mu$ A) +25 $^{\circ}$ C Max.	DF (%) +25 $^{\circ}$ C 120Hz Max.	ESR( $\Omega$ ) +25 $^{\circ}$ C 100kHz Max.	Capacitance ( $\mu$ F)	Case	Part Number	DCL ( $\mu$ A) +25 $^{\circ}$ C Max.	DF (%) +25 $^{\circ}$ C 120Hz Max.	ESR( $\Omega$ ) +25 $^{\circ}$ C 100kHz Max.
4V, +85 $^{\circ}$ C (2.5V @ +125 $^{\circ}$ C)						0.68	A	ATC214A684 $\odot$ 020□	0.5	4.0	8.0
2.2	A	ATC214A225 $\odot$ 004□	0.5	6.0	6.0	1.0	B	ATC214B105 $\odot$ 020□	0.5	4.0	6.0
3.3	A	ATC214A335 $\odot$ 004□	0.5	6.0	6.0	1.5	B	ATC214B155 $\odot$ 020□	0.5	6.0	1.5
4.7	B	ATC214B475 $\odot$ 004□	0.5	6.0	6.0	2.2	B	ATC214B225 $\odot$ 020□	0.5	6.0	3.0
6.8	B	ATC214B685 $\odot$ 004□	0.5	6.0	6.0	3.3	C	ATC214C335 $\odot$ 020	0.7	6.0	1.5
10.0	B	ATC214B106 $\odot$ 004□	0.5	6.0	1.5	4.7	C	ATC214C475 $\odot$ 020	0.9	6.0	1.2
15.0	C	ATC214C156 $\odot$ 004□	0.5	6.0	1.5	6.8	D	ATC214D685 $\odot$ 020	1.4	6.0	0.8
22.0	C	ATC214C226 $\odot$ 004□	0.6	6.0	1.0	10.0	D	ATC214D106 $\odot$ 020	2.0	6.0	0.8
33.0	D	ATC214D336 $\odot$ 004□	1.3	6.0	1.0	15.0	D	ATC214D156 $\odot$ 020	3.0	6.0	0.8
47.0	D	ATC214D476 $\odot$ 004□	1.9	6.0	1.0	22.0	D	ATC214D226 $\odot$ 020	4.4	6.0	0.5
68.0	D	ATC214D686 $\odot$ 004□	2.7	6.0	0.5	25V, +85 $^{\circ}$ C (16V @ +125 $^{\circ}$ C)					
100	D	ATC214D107 $\odot$ 004□	4.0	8.0	0.3	0.33	A	ATC214A334 $\odot$ 025□	0.5	4.0	12.0
6.3V, +85 $^{\circ}$ C (4.0V @ +125 $^{\circ}$ C)						0.47	A	ATC214A474 $\odot$ 025□	0.5	4.0	10.0
1.5	A	ATC214A155 $\odot$ 006□	0.5	6.0	6.0	0.68	B	ATC214B684 $\odot$ 025□	0.5	4.0	6.0
2.2	A	ATC214A225 $\odot$ 006□	0.5	6.0	6.0	1.0	B	ATC214B105 $\odot$ 025□	0.5	4.0	4.0
3.3	B	ATC214B335 $\odot$ 006□	0.5	6.0	8.0	1.5	B	ATC214B155 $\odot$ 025□	0.5	6.0	3.5
4.7	B	ATC214B475 $\odot$ 006□	0.5	6.0	10.0	2.2	C	ATC214C225 $\odot$ 025	0.6	6.0	2.0
6.8	B	ATC214B685 $\odot$ 006□	0.5	6.0	1.2	3.3	C	ATC214C335 $\odot$ 025	0.8	6.0	2.0
10.0	C	ATC214C106 $\odot$ 006□	0.6	6.0	0.6	4.7	D	ATC214D475 $\odot$ 025	1.2	6.0	1.5
15.0	C	ATC214C156 $\odot$ 006□	0.9	6.0	0.6	6.8	D	ATC214D685 $\odot$ 025	1.7	6.0	1.0
22.0	D	ATC214D226 $\odot$ 006□	1.3	6.0	0.5	10.0	D	ATC214D106 $\odot$ 025	2.5	6.0	0.8
33.0	D	ATC214D336 $\odot$ 006□	2.1	6.0	0.3	15.0	D	ATC214D156 $\odot$ 025	3.8	6.0	0.8
47.0	D	ATC214D476 $\odot$ 006□	3.0	6.0	0.3	35V, +85 $^{\circ}$ C (20V @ +125 $^{\circ}$ C)					
68.0	D	ATC214D686 $\odot$ 006□	4.3	6.0	0.2	0.1	A	ATC214A104 $\odot$ 035□	0.5	4.0	15.0
10V, +85 $^{\circ}$ C (6.3V @ +125 $^{\circ}$ C)						0.15	A	ATC214A154 $\odot$ 035□	0.5	4.0	12.0
1.0	A	ATC214A105 $\odot$ 010□	0.5	4.0	6.0	0.22	A	ATC214A224 $\odot$ 035□	0.5	4.0	12.0
1.5	A	ATC214A155 $\odot$ 010□	0.5	6.0	6.0	0.33	A	ATC214A334 $\odot$ 035□	0.5	4.0	12.0
2.2	B	ATC214B225 $\odot$ 010□	0.5	6.0	3.0	0.47	B	ATC214B474 $\odot$ 035□	0.5	4.0	2.5
3.3	B	ATC214B335 $\odot$ 010□	0.5	6.0	3.0	0.68	B	ATC214B684 $\odot$ 035□	0.5	4.0	2.5
4.7	B	ATC214B475 $\odot$ 010□	0.5	6.0	1.5	1.0	B	ATC214B105 $\odot$ 035□	0.5	4.0	2.0
6.8	C	ATC214C685 $\odot$ 010□	0.7	6.0	0.8	1.5	B	ATC214B155 $\odot$ 035□	0.5	4.0	2.0
10.0	C	ATC214C106 $\odot$ 010□	1.0	6.0	0.6	1.5	C	ATC214C155 $\odot$ 035	0.5	6.0	2.5
15.0	C	ATC214C156 $\odot$ 010□	1.5	6.0	0.5	2.2	C	ATC214C225 $\odot$ 035	0.8	6.0	1.5
22.0	D	ATC214D226 $\odot$ 010□	2.2	6.0	0.4	3.3	D	ATC214D335 $\odot$ 035	1.2	6.0	1.5
33.0	D	ATC214D336 $\odot$ 010□	3.3	6.0	0.25	4.7	D	ATC214D475 $\odot$ 035	1.6	6.0	1.0
47.0	D	ATC214D476 $\odot$ 010□	4.7	6.0	0.22	6.8	D	ATC214D685 $\odot$ 035	2.4	6.0	0.8
16V, +85 $^{\circ}$ C (10V @ +125 $^{\circ}$ C)						10.0	D	ATC214D106 $\odot$ 035	3.5	6.0	0.6
0.68	A	ATC214A684 $\odot$ 016□	0.5	6.0	10.0	50V, +85 $^{\circ}$ C (32V @ +125 $^{\circ}$ C)					
1.0	A	ATC214A105 $\odot$ 016□	0.5	4.0	6.0	0.1	A	ATC214A104 $\odot$ 050□	0.5	4.0	15.0
1.5	B	ATC214B155 $\odot$ 016□	0.5	6.0	4.0	0.15	B	ATC214B154 $\odot$ 050□	0.5	4.0	12.0
2.2	B	ATC214B225 $\odot$ 016□	0.5	6.0	3.0	0.22	B	ATC214B224 $\odot$ 050□	0.5	4.0	12.0
3.3	B	ATC214B335 $\odot$ 016□	0.5	6.0	2.5	0.33	B	ATC214B334 $\odot$ 050□	0.5	4.0	8.0
4.7	C	ATC214C475 $\odot$ 016□	0.8	6.0	1.5	0.47	C	ATC214C474 $\odot$ 050	0.5	4.0	5.0
6.8	C	ATC214C685 $\odot$ 016□	1.1	6.0	1.0	0.68	C	ATC214C684 $\odot$ 050	0.5	4.0	4.0
10.0	C	ATC214C106 $\odot$ 016□	1.6	6.0	1.5	1.0	C	ATC214C105 $\odot$ 050	0.5	4.0	3.5
15.0	D	ATC214D156 $\odot$ 016□	2.4	6.0	0.5	1.5	D	ATC214D155 $\odot$ 050	0.8	6.0	2.5
22.0	D	ATC214D226 $\odot$ 016□	3.5	6.0	0.25	2.2	D	ATC214D225 $\odot$ 050	1.1	6.0	2.0
33.0	D	ATC214D336 $\odot$ 016□	5.3	6.0	0.25	3.3	D	ATC214D335 $\odot$ 050	1.7	6.0	1.0
20V, +85 $^{\circ}$ C (13V @ +125 $^{\circ}$ C)						4.7	D	ATC214D475 $\odot$ 050	2.4	6.0	0.8
0.47	A	ATC214A474 $\odot$ 020□	0.5	4.0	10.0						

※ $\odot$ :Capacitance tolerance code (K= $\pm$ 10%, M= $\pm$ 20%); □: Internal code (B=Black molded case, Laser marking; Y=Yellow molded case, Laser marking).

**Sunlord**

Specifications subject to change without notice. Please check our website for latest information. Revised 2016/04/15

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