

# 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

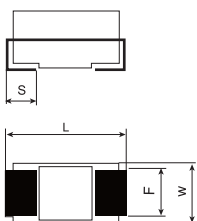
- Communication
- Consumer electronics
- Automotive electronics
- Instruments
- Medical electronics

## PRODUCT IDENTIFICATION

<b>TC</b> ①	<b>212</b> ②	<b>B</b> ③	<b>105</b> ④	<b>M</b> ⑤	<b>035</b> ⑥	<b>B</b> ⑦																																		
<table border="1"> <tr><th colspan="2">Type</th></tr> <tr><td>TC</td><td>Solid Tantalum Chip Capacitor</td></tr> <tr><td>ATC</td><td>Solid Tantalum Chip Cap. for Automotive</td></tr> </table>		Type		TC	Solid Tantalum Chip Capacitor	ATC	Solid Tantalum Chip Cap. for Automotive	<table border="1"> <tr><th colspan="2">Series</th></tr> <tr><td>211</td><td>Industrial</td></tr> <tr><td>212</td><td>Low ESR</td></tr> <tr><td>214</td><td>Automotive</td></tr> </table>		Series		211	Industrial	212	Low ESR	214	Automotive	<table border="1"> <tr><th colspan="2">(L×W) (mm)</th></tr> <tr><th colspan="2">External Dimensions (L×W) (mm)</th></tr> <tr><td>A</td><td>3.2×1.6</td></tr> <tr><td>B</td><td>3.5×2.8</td></tr> <tr><td>C</td><td>6.0×3.2</td></tr> <tr><td>D/E</td><td>7.3×4.3</td></tr> </table>			(L×W) (mm)		External Dimensions (L×W) (mm)		A	3.2×1.6	B	3.5×2.8	C	6.0×3.2	D/E	7.3×4.3								
Type																																								
TC	Solid Tantalum Chip Capacitor																																							
ATC	Solid Tantalum Chip Cap. for Automotive																																							
Series																																								
211	Industrial																																							
212	Low ESR																																							
214	Automotive																																							
(L×W) (mm)																																								
External Dimensions (L×W) (mm)																																								
A	3.2×1.6																																							
B	3.5×2.8																																							
C	6.0×3.2																																							
D/E	7.3×4.3																																							
<table border="1"> <tr><th colspan="2">Nominal Capacitance</th></tr> <tr><th>Example</th><th>Nominal Value</th></tr> <tr><td>105</td><td>1.0μF</td></tr> <tr><td>106</td><td>10μF</td></tr> </table>		Nominal Capacitance		Example	Nominal Value	105	1.0μF	106	10μF	<table border="1"> <tr><th colspan="2">Rated DC Voltage</th></tr> <tr><td>002</td><td>2.5Vdc</td></tr> <tr><td>004</td><td>4Vdc</td></tr> <tr><td>006</td><td>6.3Vdc</td></tr> <tr><td>010</td><td>10Vdc</td></tr> <tr><td>016</td><td>16Vdc</td></tr> <tr><td>020</td><td>20Vdc</td></tr> <tr><td>025</td><td>25Vdc</td></tr> <tr><td>035</td><td>35Vdc</td></tr> <tr><td>050</td><td>50Vdc</td></tr> </table>			Rated DC Voltage		002	2.5Vdc	004	4Vdc	006	6.3Vdc	010	10Vdc	016	16Vdc	020	20Vdc	025	25Vdc	035	35Vdc	050	50Vdc	<table border="1"> <tr><th colspan="2">Internal Code</th></tr> <tr><td>B</td><td>Black Molded Case, Laser Marking</td></tr> <tr><td>Y</td><td>Yellow Molded Case, Laser Marking</td></tr> </table>		Internal Code		B	Black Molded Case, Laser Marking	Y	Yellow Molded Case, Laser Marking
Nominal Capacitance																																								
Example	Nominal Value																																							
105	1.0μF																																							
106	10μF																																							
Rated DC Voltage																																								
002	2.5Vdc																																							
004	4Vdc																																							
006	6.3Vdc																																							
010	10Vdc																																							
016	16Vdc																																							
020	20Vdc																																							
025	25Vdc																																							
035	35Vdc																																							
050	50Vdc																																							
Internal Code																																								
B	Black Molded Case, Laser Marking																																							
Y	Yellow Molded Case, Laser Marking																																							
<table border="1"> <tr><th colspan="2">Capacitance Tolerance</th></tr> <tr><td>K</td><td>±10%</td></tr> <tr><td>M</td><td>±20%</td></tr> </table>		Capacitance Tolerance		K	±10%	M	±20%																																	
Capacitance Tolerance																																								
K	±10%																																							
M	±20%																																							

## 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

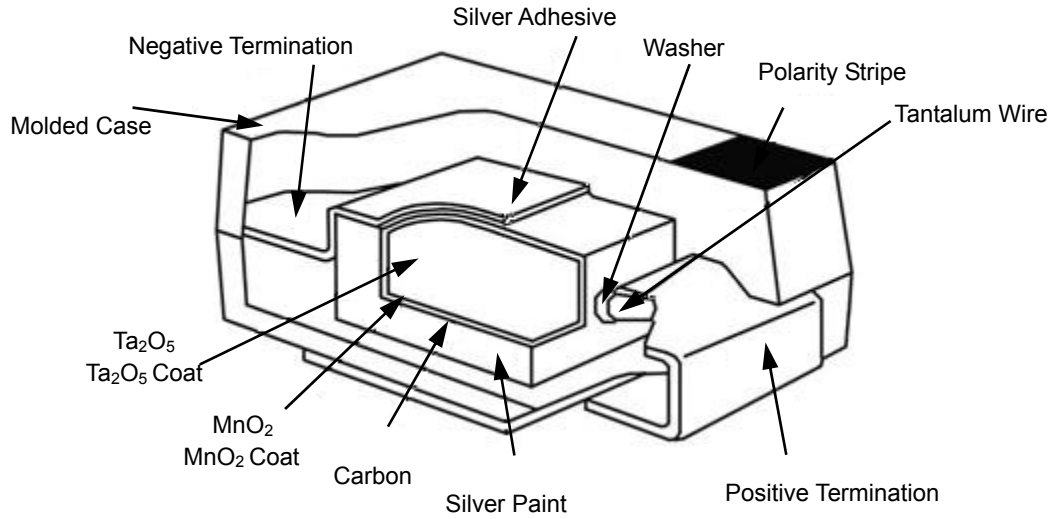
Item	SPEC									Test Condition
Operating Temp	-55°C~+125°C									
C <sub>R</sub> Range	0.10μF~680μF									25°C, 120Hz
C <sub>R</sub> Tolerance	±10% or ±20%									25°C, 120Hz
Rated Voltage (V <sub>R</sub> )	2.5V	4V	6.3V	10V	16V	20V	25V	35V	50V	85°C
Category Voltage (V <sub>C</sub> )	1.6V	2.5V	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

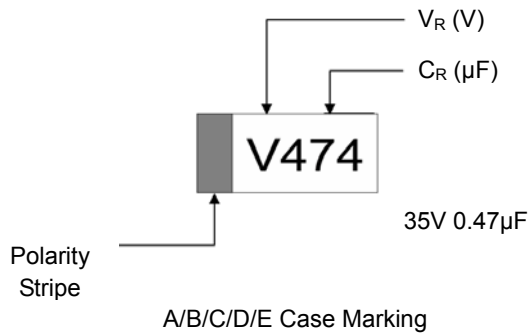
Rated Voltage (VR)		2.5	4	6.3	10	16	20	25	35	50
Voltage Code		e	G	J	A	C	D	E	V	T
CR (μF)	C Code	Case Code								
0.15	154									B
0.22	224									B/A
0.33	334							A	A	B/A
0.47	474							A	B/A	C/B/A
0.68	684						A	A	B/A	C/B/A
1.0	105			A	A	A	A	B/A	B/A	C/B
1.5	155			A	A	A	B/A	B/A	C/B	C/B
2.2	225		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 <sub>R</sub> )	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 ( $\mu\text{F}$ )	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.
22.0	A	TC211A226 $\odot$ 010□	2.2	8.0	4.0	47.0	C	TC211C476 $\odot$ 016□	7.5	6.0	1.2
22.0	B	TC211B226 $\odot$ 010□	2.2	6.0	3.0	47.0	D	TC211D476 $\odot$ 016□	7.5	6.0	0.8
22.0	C	TC211C226 $\odot$ 010□	2.2	6.0	1.8	68.0	D	TC211D686 $\odot$ 016□	10.8	6.0	0.8
33.0	A	TC211A336 $\odot$ 010□	3.3	15.0	6.0	100.0	C	TC211C107 $\odot$ 016□	16.0	10.0	1.0
33.0	B	TC211B336 $\odot$ 010□	3.3	6.0	3.5	100.0	D	TC211D107 $\odot$ 016□	16.0	8.0	0.7
33.0	C	TC211C336 $\odot$ 010□	3.3	6.0	1.6	150.0	D	TC211D157 $\odot$ 016□	24.0	12.0	0.7
33.0	D	TC211D336 $\odot$ 010□	3.3	6.0	0.8	150.0	E	TC211E157 $\odot$ 016□	24.0	8.0	0.5
47.0	A	TC211A476 $\odot$ 010□	4.7	15.0	4.0	220.0	D	TC211D227 $\odot$ 016□	35.2	15.0	0.9
47.0	B	TC211B476 $\odot$ 010□	4.7	6.0	1.0	220.0	E	TC211E227 $\odot$ 016□	35.2	10.0	0.5
47.0	C	TC211C476 $\odot$ 010□	4.7	6.0	1.2	330.0	E	TC211E337 $\odot$ 016□	52.8	10.0	0.5
47.0	D	TC211D476 $\odot$ 010□	4.7	6.0	0.8	20V, +85 $^{\circ}\text{C}$ (13V @ +125 $^{\circ}\text{C}$ )					
68.0	B	TC211B686 $\odot$ 010□	6.8	10.0	3.0	0.68	A	TC211A684 $\odot$ 020□	0.5	4.0	12.0
68.0	C	TC211C686 $\odot$ 010□	6.8	6.0	1.2	1.0	A	TC211A105 $\odot$ 020□	0.5	4.0	10.0
68.0	D	TC211D686 $\odot$ 010□	6.8	6.0	0.8	1.5	A	TC211A155 $\odot$ 020□	0.5	6.0	8.0
100.0	B	TC211B107 $\odot$ 010□	10.0	15.0	1.5	1.5	B	TC211B155 $\odot$ 020□	0.5	6.0	5.0
100.0	C	TC211C107 $\odot$ 010□	10.0	8.0	1.2	2.2	A	TC211A225 $\odot$ 020□	0.5	6.0	7.0
100.0	D	TC211D107 $\odot$ 010□	10.0	8.0	0.7	2.2	B	TC211B225 $\odot$ 020□	0.5	6.0	3.5
150.0	C	TC211C157 $\odot$ 010□	15.0	10.0	0.9	3.3	A	TC211A335 $\odot$ 020□	0.7	6.0	7.0
150.0	D	TC211D157 $\odot$ 010□	15.0	8.0	0.7	3.3	B	TC211B335 $\odot$ 020□	0.7	6.0	3.5
150.0	E	TC211E157 $\odot$ 010□	15.0	8.0	0.5	4.7	A	TC211A475 $\odot$ 020□	0.9	6.0	4.0
220.0	D	TC211D227 $\odot$ 010□	22.0	8.0	0.5	4.7	B	TC211B475 $\odot$ 020□	0.9	6.0	3.5
220.0	E	TC211E227 $\odot$ 010□	22.0	8.0	0.5	4.7	C	TC211C475 $\odot$ 020□	0.9	6.0	2.4
330.0	D	TC211D337 $\odot$ 010□	33.0	10.0	0.5	6.8	A	TC211A685 $\odot$ 020□	1.4	8.0	6.0
330.0	E	TC211E337 $\odot$ 010□	33.0	10.0	0.5	6.8	B	TC211B685 $\odot$ 020□	1.4	6.0	3.5
470.0	E	TC211E477 $\odot$ 010□	47.0	10.0	0.5	6.8	C	TC211C685 $\odot$ 020□	1.4	6.0	2.0
16V, +85 $^{\circ}\text{C}$ (10V @ +125 $^{\circ}\text{C}$ )						6.8	D	TC211D685 $\odot$ 020□	1.4	6.0	1.9
1.0	A	TC211A105 $\odot$ 016□	0.5	4.0	10.0	10.0	B	TC211B106 $\odot$ 020□	2.0	6.0	3.0
1.5	A	TC211A155 $\odot$ 016□	0.5	6.0	8.0	10.0	C	TC211C106 $\odot$ 020□	2.0	6.0	1.8
2.2	A	TC211A225 $\odot$ 016□	0.5	6.0	6.0	10.0	D	TC211D106 $\odot$ 020□	2.0	6.0	1.0
2.2	B	TC211B225 $\odot$ 016□	0.5	6.0	4.0	15.0	C	TC211C156 $\odot$ 020□	3.0	6.0	1.7
3.3	A	TC211A335 $\odot$ 016□	0.52	6.0	6.0	15.0	D	TC211D156 $\odot$ 020□	3.0	6.0	1.0
3.3	B	TC211B335 $\odot$ 016□	0.5	6.0	3.5	22.0	B	TC211B226 $\odot$ 020□	4.4	8.0	4.0
4.7	A	TC211A475 $\odot$ 016□	0.8	6.0	6.0	22.0	C	TC211C226 $\odot$ 020□	4.4	6.0	1.2
4.7	B	TC211B475 $\odot$ 016□	0.8	6.0	3.5	22.0	D	TC211D226 $\odot$ 020□	4.4	6.0	0.8
4.7	C	TC211C475 $\odot$ 016□	0.8	6.0	2.4	33.0	C	TC211C336 $\odot$ 020□	6.6	6.0	1.2
6.8	A	TC211A685 $\odot$ 016□	1.1	6.0	7.0	33.0	D	TC211D336 $\odot$ 020□	6.6	6.0	0.8
6.8	B	TC211B685 $\odot$ 016□	1.1	6.0	3.5	47.0	C	TC211C476 $\odot$ 020□	9.4	10.0	1.0
6.8	C	TC211C685 $\odot$ 016□	1.1	6.0	2.0	47.0	D	TC211D476 $\odot$ 020□	9.4	6.0	0.8
10.0	A	TC211A106 $\odot$ 016□	1.6	8.0	7.0	47.0	E	TC211E476 $\odot$ 020□	9.4	6.0	0.8
10.0	B	TC211B106 $\odot$ 016□	1.6	6.0	2.8	68.0	D	TC211D686 $\odot$ 020□	13.6	6.0	0.8
10.0	C	TC211C106 $\odot$ 016□	1.6	6.0	1.8	68.0	E	TC211E686 $\odot$ 020□	13.6	6.0	0.8
15.0	B	TC211B156 $\odot$ 016□	2.4	6.0	3.0	100.0	D	TC211D107 $\odot$ 020□	20.0	8.0	0.6
15.0	C	TC211C156 $\odot$ 016□	2.4	6.0	1.8	100.0	E	TC211E107 $\odot$ 020□	20.0	8.0	0.5
22.0	A	TC211A226 $\odot$ 016□	3.5	15.0	4.0	150.0	E	TC211E157 $\odot$ 020□	30.0	8.0	0.5
22.0	B	TC211B226 $\odot$ 016□	3.5	8.0	2.2	25V, +85 $^{\circ}\text{C}$ (16V @ +125 $^{\circ}\text{C}$ )					
22.0	C	TC211C226 $\odot$ 016□	3.5	6.0	1.6	0.33	A	TC211A334 $\odot$ 025□	0.5	4.0	15.0
22.0	D	TC211D226 $\odot$ 016□	3.5	6.0	0.8	0.47	A	TC211A474 $\odot$ 025□	0.5	4.0	14.0
33.0	B	TC211B336 $\odot$ 016□	5.3	8.0	2.0	0.68	A	TC211A684 $\odot$ 025□	0.5	4.0	10.0
33.0	C	TC211C336 $\odot$ 016□	5.3	6.0	1.2	1.0	A	TC211A105 $\odot$ 025□	0.5	4.0	8.0
33.0	D	TC211D336 $\odot$ 016□	5.3	6.0	0.8	1.0	B	TC211B105 $\odot$ 025□	0.5	4.0	5.0
47.0	B	TC211B476 $\odot$ 016□	7.5	18.0	1.0	1.5	A	TC211A155 $\odot$ 025□	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□	0.5	6.0	4.0
15.0	A	TC212A156 $\odot$ 002□	0.5	6.0	4.0
15.0	B	TC212B156 $\odot$ 002□	0.5	6.0	3.0
22.0	A	TC212A226 $\odot$ 002□	0.6	6.0	3.0
33.0	A	TC212A336 $\odot$ 002□	0.8	6.0	3.0
47.0	A	TC212A476 $\odot$ 002□	1.2	10.0	3.0
68.0	A	TC212A686 $\odot$ 002□	1.7	10.0	2.5
68.0	B	TC212B686 $\odot$ 002□	1.7	6.0	1.8
100.0	A	TC212A107 $\odot$ 002□	2.5	20.0	2.0
100.0	B	TC212B107 $\odot$ 002□	2.5	8.0	1.0
150.0	B	TC212B157 $\odot$ 002□	3.8	10.0	1.5
220.0	B	TC212B227 $\odot$ 002□	5.5	18.0	1.5
4V, +85°C (2.5V @ +125°C)					
2.2	A	TC212A225 $\odot$ 004□	0.5	6.0	6.0
3.3	A	TC212A335 $\odot$ 004□	0.5	6.0	6.0
4.7	A	TC212A475 $\odot$ 004□	0.5	6.0	5.0
6.8	A	TC212A685 $\odot$ 004□	0.5	6.0	4.0
10.0	A	TC212A106 $\odot$ 004□	0.5	6.0	3.0
10.0	B	TC212B106 $\odot$ 004□	0.5	6.0	1.5
15.0	A	TC212A156 $\odot$ 004□	0.6	6.0	1.5
15.0	B	TC212B156 $\odot$ 004□	0.6	6.0	1.2
22.0	A	TC212A226 $\odot$ 004□	0.9	6.0	1.5
22.0	B	TC212B226 $\odot$ 004□	0.9	6.0	0.6
33.0	A	TC212A336 $\odot$ 004□	1.3	6.0	2.5
33.0	B	TC212B336 $\odot$ 004□	1.3	6.0	0.5
33.0	C	TC212C336 $\odot$ 004□	1.3	6.0	0.8
47.0	A	TC212A476 $\odot$ 004□	1.9	6.0	2.0
47.0	B	TC212B476 $\odot$ 004□	1.9	6.0	0.8
47.0	C	TC212C476 $\odot$ 004□	1.9	6.0	1.0
68.0	B	TC212B686 $\odot$ 004□	2.7	6.0	2.5
68.0	C	TC212C686 $\odot$ 004□	2.7	6.0	0.5
68.0	D	TC212D686 $\odot$ 004□	2.7	6.0	0.5
100.0	A	TC212A107 $\odot$ 004□	4.0	18.0	3.0
100.0	B	TC212B107 $\odot$ 004□	4.0	8.0	1.0
100.0	C	TC212C107 $\odot$ 004□	4.0	8.0	0.35
100.0	D	TC212D107 $\odot$ 004□	4.0	8.0	0.2
150.0	B	TC212B157 $\odot$ 004□	6.0	15.0	1.0
150.0	C	TC212C157 $\odot$ 004□	6.0	8.0	0.3
150.0	D	TC212D157 $\odot$ 004□	6.0	8.0	0.2
220.0	B	TC212B227 $\odot$ 004□	8.8	18.0	0.4
220.0	C	TC212C227 $\odot$ 004□	8.8	8.0	0.5
220.0	D	TC212D227 $\odot$ 004□	8.8	8.0	0.3
330.0	B	TC212B337 $\odot$ 004□	13.2	18.0	0.7
330.0	C	TC212C337 $\odot$ 004□	13.2	8.0	0.8
330.0	D	TC212D337 $\odot$ 004□	13.2	8.0	0.2
330.0	E	TC212E337 $\odot$ 004□	13.2	8.0	0.2
470.0	E	TC212E477 $\odot$ 004□	18.8	8.0	0.2
680.0	E	TC212E687 $\odot$ 004□	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□	0.5	6.0	10.0
1.5	A	TC212A155 $\odot$ 006□	0.5	6.0	6.0
2.2	A	TC212A225 $\odot$ 006□	0.5	6.0	6.0
3.3	A	TC212A335 $\odot$ 006□	0.5	6.0	6.0
4.7	A	TC212A475 $\odot$ 006□	0.5	6.0	4.0
6.8	A	TC212A685 $\odot$ 006□	0.5	6.0	3.5
6.8	B	TC212B685 $\odot$ 006□	0.5	6.0	3.0
10.0	A	TC212A106 $\odot$ 006□	0.6	6.0	2.0
10.0	B	TC212B106 $\odot$ 006□	0.6	6.0	1.0
15.0	A	TC212A156 $\odot$ 006□	0.9	6.0	2.0
15.0	B	TC212B156 $\odot$ 006□	0.9	6.0	0.7
22.0	A	TC212A226 $\odot$ 006□	1.4	6.0	2.5
22.0	B	TC212B226 $\odot$ 006□	1.4	6.0	0.8
33.0	A	TC212A336 $\odot$ 006□	2.1	8.0	1.5
33.0	B	TC212B336 $\odot$ 006□	2.1	6.0	0.8
33.0	C	TC212C336 $\odot$ 006□	2.1	6.0	0.3
47.0	A	TC212A476 $\odot$ 006□	2.9	8.0	2.5
47.0	B	TC212B476 $\odot$ 006□	2.9	6.0	0.5
47.0	C	TC212C476 $\odot$ 006□	2.9	6.0	0.3
68.0	B	TC212B686 $\odot$ 006□	4.3	10.0	0.65
68.0	C	TC212C686 $\odot$ 006□	4.3	6.0	0.3
68.0	D	TC212D686 $\odot$ 006□	4.3	6.0	0.2
100.0	A	TC212A107 $\odot$ 006□	6.3	20.0	2.0
100.0	B	TC212B107 $\odot$ 006□	6.3	10.0	1.5
100.0	C	TC212C107 $\odot$ 006□	6.3	8.0	0.3
100.0	D	TC212D107 $\odot$ 006□	6.3	8.0	0.2
150.0	B	TC212B157 $\odot$ 006□	9.5	15.0	0.6
150.0	C	TC212C157 $\odot$ 006□	9.5	8.0	0.3
150.0	D	TC212D157 $\odot$ 006□	9.5	8.0	0.2
220.0	B	TC212B227 $\odot$ 006□	13.9	18.0	0.7
220.0	C	TC212C227 $\odot$ 006□	13.9	8.0	0.3
220.0	D	TC212D227 $\odot$ 006□	13.9	8.0	0.15
220.0	E	TC212E227 $\odot$ 006□	13.9	8.0	0.15
330.0	D	TC212D337 $\odot$ 006□	20.8	8.0	0.15
330.0	E	TC212E337 $\odot$ 006□	20.8	8.0	0.15
470.0	D	TC212D477 $\odot$ 006□	29.6	12.0	0.15
470.0	E	TC212E477 $\odot$ 006□	29.6	10.0	0.12
10V, +85°C (6.3V @ +125°C)					
1.0	A	TC212A105 $\odot$ 010□	0.5	4.0	8.0
1.5	A	TC212A155 $\odot$ 010□	0.5	6.0	6.0
2.2	A	TC212A225 $\odot$ 010□	0.5	6.0	6.0
3.3	A	TC212A335 $\odot$ 010□	0.5	6.0	4.0
4.7	A	TC212A475 $\odot$ 010□	0.5	6.0	3.0
4.7	B	TC212B475 $\odot$ 010□	0.5	6.0	1.5
6.8	A	TC212A685 $\odot$ 010□	0.7	6.0	3.0
6.8	B	TC212B685 $\odot$ 010□	0.7	6.0	1.2
10.0	A	TC212A106 $\odot$ 010□	1.0	6.0	1.8
10.0	B	TC212B106 $\odot$ 010□	1.0	6.0	0.8
10.0	C	TC212C106 $\odot$ 010□	1.0	6.0	0.6
15.0	A	TC212A156 $\odot$ 010□	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 $\square$	0.5	4.0	8.0
2.2	A	ATC214A225 $\odot$ 004 $\square$	0.5	6.0	6.0	1.0	B	ATC214B105 $\odot$ 020 $\square$	0.5	4.0	6.0
3.3	A	ATC214A335 $\odot$ 004 $\square$	0.5	6.0	6.0	1.5	B	ATC214B155 $\odot$ 020 $\square$	0.5	6.0	1.5
4.7	B	ATC214B475 $\odot$ 004 $\square$	0.5	6.0	6.0	2.2	B	ATC214B225 $\odot$ 020 $\square$	0.5	6.0	3.0
6.8	B	ATC214B685 $\odot$ 004 $\square$	0.5	6.0	6.0	3.3	C	ATC214C335 $\odot$ 020	0.7	6.0	1.5
10.0	B	ATC214B106 $\odot$ 004 $\square$	0.5	6.0	1.5	4.7	C	ATC214C475 $\odot$ 020	0.9	6.0	1.2
15.0	C	ATC214C156 $\odot$ 004 $\square$	0.5	6.0	1.5	6.8	D	ATC214D685 $\odot$ 020	1.4	6.0	0.8
22.0	C	ATC214C226 $\odot$ 004 $\square$	0.6	6.0	1.0	10.0	D	ATC214D106 $\odot$ 020	2.0	6.0	0.8
33.0	D	ATC214D336 $\odot$ 004 $\square$	1.3	6.0	1.0	15.0	D	ATC214D156 $\odot$ 020	3.0	6.0	0.8
47.0	D	ATC214D476 $\odot$ 004 $\square$	1.9	6.0	1.0	22.0	D	ATC214D226 $\odot$ 020	4.4	6.0	0.5
68.0	D	ATC214D686 $\odot$ 004 $\square$	2.7	6.0	0.5	25V, +85 $^{\circ}$ C (16V @ +125 $^{\circ}$ C)					
100	D	ATC214D107 $\odot$ 004 $\square$	4.0	8.0	0.3	0.33	A	ATC214A334 $\odot$ 025 $\square$	0.5	4.0	12.0
6.3V, +85 $^{\circ}$ C (4.0V @ +125 $^{\circ}$ C)						0.47	A	ATC214A474 $\odot$ 025 $\square$	0.5	4.0	10.0
1.5	A	ATC214A155 $\odot$ 006 $\square$	0.5	6.0	6.0	0.68	B	ATC214B684 $\odot$ 025 $\square$	0.5	4.0	6.0
2.2	A	ATC214A225 $\odot$ 006 $\square$	0.5	6.0	6.0	1.0	B	ATC214B105 $\odot$ 025 $\square$	0.5	4.0	4.0
3.3	B	ATC214B335 $\odot$ 006 $\square$	0.5	6.0	8.0	1.5	B	ATC214B155 $\odot$ 025 $\square$	0.5	6.0	3.5
4.7	B	ATC214B475 $\odot$ 006 $\square$	0.5	6.0	10.0	2.2	C	ATC214C225 $\odot$ 025	0.6	6.0	2.0
6.8	B	ATC214B685 $\odot$ 006 $\square$	0.5	6.0	1.2	3.3	C	ATC214C335 $\odot$ 025	0.8	6.0	2.0
10.0	C	ATC214C106 $\odot$ 006 $\square$	0.6	6.0	0.6	4.7	D	ATC214D475 $\odot$ 025	1.2	6.0	1.5
15.0	C	ATC214C156 $\odot$ 006 $\square$	0.9	6.0	0.6	6.8	D	ATC214D685 $\odot$ 025	1.7	6.0	1.0
22.0	D	ATC214D226 $\odot$ 006 $\square$	1.3	6.0	0.5	10.0	D	ATC214D106 $\odot$ 025	2.5	6.0	0.8
33.0	D	ATC214D336 $\odot$ 006 $\square$	2.1	6.0	0.3	15.0	D	ATC214D156 $\odot$ 025	3.8	6.0	0.8
47.0	D	ATC214D476 $\odot$ 006 $\square$	3.0	6.0	0.3	35V, +85 $^{\circ}$ C (20V @ +125 $^{\circ}$ C)					
68.0	D	ATC214D686 $\odot$ 006 $\square$	4.3	6.0	0.2	0.1	A	ATC214A104 $\odot$ 035 $\square$	0.5	4.0	15.0
10V, +85 $^{\circ}$ C (6.3V @ +125 $^{\circ}$ C)						0.15	A	ATC214A154 $\odot$ 035 $\square$	0.5	4.0	12.0
1.0	A	ATC214A105 $\odot$ 010 $\square$	0.5	4.0	6.0	0.22	A	ATC214A224 $\odot$ 035 $\square$	0.5	4.0	12.0
1.5	A	ATC214A155 $\odot$ 010 $\square$	0.5	6.0	6.0	0.33	A	ATC214A334 $\odot$ 035 $\square$	0.5	4.0	12.0
2.2	B	ATC214B225 $\odot$ 010 $\square$	0.5	6.0	3.0	0.47	B	ATC214B474 $\odot$ 035 $\square$	0.5	4.0	2.5
3.3	B	ATC214B335 $\odot$ 010 $\square$	0.5	6.0	3.0	0.68	B	ATC214B684 $\odot$ 035 $\square$	0.5	4.0	2.5
4.7	B	ATC214B475 $\odot$ 010 $\square$	0.5	6.0	1.5	1.0	B	ATC214B105 $\odot$ 035 $\square$	0.5	4.0	2.0
6.8	C	ATC214C685 $\odot$ 010 $\square$	0.7	6.0	0.8	1.5	B	ATC214B155 $\odot$ 035 $\square$	0.5	4.0	2.0
10.0	C	ATC214C106 $\odot$ 010 $\square$	1.0	6.0	0.6	1.5	C	ATC214C155 $\odot$ 035	0.5	6.0	2.5
15.0	C	ATC214C156 $\odot$ 010 $\square$	1.5	6.0	0.5	2.2	C	ATC214C225 $\odot$ 035	0.8	6.0	1.5
22.0	D	ATC214D226 $\odot$ 010 $\square$	2.2	6.0	0.4	3.3	D	ATC214D335 $\odot$ 035	1.2	6.0	1.5
33.0	D	ATC214D336 $\odot$ 010 $\square$	3.3	6.0	0.25	4.7	D	ATC214D475 $\odot$ 035	1.6	6.0	1.0
47.0	D	ATC214D476 $\odot$ 010 $\square$	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 $\square$	0.5	6.0	10.0	50V, +85 $^{\circ}$ C (32V @ +125 $^{\circ}$ C)					
1.0	A	ATC214A105 $\odot$ 016 $\square$	0.5	4.0	6.0	0.1	A	ATC214A104 $\odot$ 050 $\square$	0.5	4.0	15.0
1.5	B	ATC214B155 $\odot$ 016 $\square$	0.5	6.0	4.0	0.15	B	ATC214B154 $\odot$ 050 $\square$	0.5	4.0	12.0
2.2	B	ATC214B225 $\odot$ 016 $\square$	0.5	6.0	3.0	0.22	B	ATC214B224 $\odot$ 050 $\square$	0.5	4.0	12.0
3.3	B	ATC214B335 $\odot$ 016 $\square$	0.5	6.0	2.5	0.33	B	ATC214B334 $\odot$ 050 $\square$	0.5	4.0	8.0
4.7	C	ATC214C475 $\odot$ 016 $\square$	0.8	6.0	1.5	0.47	C	ATC214C474 $\odot$ 050	0.5	4.0	5.0
6.8	C	ATC214C685 $\odot$ 016 $\square$	1.1	6.0	1.0	0.68	C	ATC214C684 $\odot$ 050	0.5	4.0	4.0
10.0	C	ATC214C106 $\odot$ 016 $\square$	1.6	6.0	1.5	1.0	C	ATC214C105 $\odot$ 050	0.5	4.0	3.5
15.0	D	ATC214D156 $\odot$ 016 $\square$	2.4	6.0	0.5	1.5	D	ATC214D155 $\odot$ 050	0.8	6.0	2.5
22.0	D	ATC214D226 $\odot$ 016 $\square$	3.5	6.0	0.25	2.2	D	ATC214D225 $\odot$ 050	1.1	6.0	2.0
33.0	D	ATC214D336 $\odot$ 016 $\square$	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 $\square$	0.5	4.0	10.0						

※ $\odot$ :Capacitance tolerance code (K= $\pm$ 10%, M= $\pm$ 20%);  $\square$ : 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

Sunlord Industrial Park, Dafuyuan Industrial Zone, Guanlan, Shenzhen, China 518110 Tel: 0086-755-29832660 Fax: 0086-755-82269029 E-Mail: sunlord@sunlordinc.com

