

# Chip Solid Polymer Tantalum Capacitors – TC3 Series

Operating Temp.: -55°C~+105°C



## FEATURES

- Polymer cathode technology, safe failure mode
- Ultra low ESR
- Self-healing capability, high reliability
- Excellent stability of capacitance within operating temperature range
- High volumetric efficiency

## APPLICATIONS

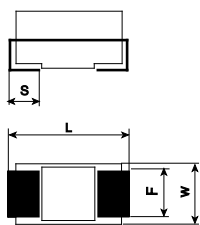
- Communication
- Consumer electronics
- Instruments

## PRODUCT IDENTIFICATION

<u>TC</u>	<u>311</u>	<u>B</u>	<u>107</u>	<u>M</u>	<u>004</u>	<u>B</u>	<u>070</u>																																																														
①	②	③	④	⑤	⑥	⑦	⑧																																																														
<table border="1"> <tr><th colspan="2">Type</th></tr> <tr><td>TC</td><td>Solid Tantalum Chip Capacitor</td></tr> </table>		Type		TC	Solid Tantalum Chip Capacitor	<table border="1"> <tr><th colspan="2">Series</th></tr> <tr><td>311</td><td>Polymer</td></tr> <tr><td>312</td><td>High Voltage Polymer</td></tr> </table>		Series		311	Polymer	312	High Voltage Polymer	<table border="1"> <tr><th colspan="2">External Dimensions (LxW) (mm)</th></tr> <tr><td>B</td><td>3.5x2.8</td></tr> <tr><td>C</td><td>6.0x3.2</td></tr> <tr><td>D</td><td>7.3x4.3</td></tr> <tr><td>E</td><td>7.3x4.3</td></tr> <tr><td>W</td><td>7.3x6.0</td></tr> <tr><td>G2</td><td>8.5x7.5</td></tr> </table>		External Dimensions (LxW) (mm)		B	3.5x2.8	C	6.0x3.2	D	7.3x4.3	E	7.3x4.3	W	7.3x6.0	G2	8.5x7.5	<table border="1"> <tr><th colspan="2">Nominal Capacitance</th></tr> <tr><th>Example</th><th>Nominal Value</th></tr> <tr><td>106</td><td>10μF</td></tr> <tr><td>107</td><td>100μF</td></tr> </table>		Nominal Capacitance		Example	Nominal Value	106	10μF	107	100μF	<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%	<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> </table>		Rated DC Voltage		002	2.5Vdc	004	4Vdc	006	6.3Vdc	010	10Vdc	016	16Vdc	<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
Type																																																																					
TC	Solid Tantalum Chip Capacitor																																																																				
Series																																																																					
311	Polymer																																																																				
312	High Voltage Polymer																																																																				
External Dimensions (LxW) (mm)																																																																					
B	3.5x2.8																																																																				
C	6.0x3.2																																																																				
D	7.3x4.3																																																																				
E	7.3x4.3																																																																				
W	7.3x6.0																																																																				
G2	8.5x7.5																																																																				
Nominal Capacitance																																																																					
Example	Nominal Value																																																																				
106	10μF																																																																				
107	100μF																																																																				
Capacitance Tolerance																																																																					
K	±10%																																																																				
M	±20%																																																																				
Rated DC Voltage																																																																					
002	2.5Vdc																																																																				
004	4Vdc																																																																				
006	6.3Vdc																																																																				
010	10Vdc																																																																				
016	16Vdc																																																																				
Internal Code																																																																					
B	Black Molded Case, Laser Marking																																																																				
Y	Yellow Molded Case, Laser Marking																																																																				
<table border="1"> <tr><th colspan="2">ESR</th></tr> <tr><td>035</td><td>35mΩ</td></tr> <tr><td>070</td><td>70mΩ</td></tr> </table>		ESR		035	35mΩ	070	70mΩ	<table border="1"> <tr><th colspan="2">Nominal Capacitance</th></tr> <tr><th>Example</th><th>Nominal Value</th></tr> <tr><td>106</td><td>10μF</td></tr> <tr><td>107</td><td>100μF</td></tr> </table>		Nominal Capacitance		Example	Nominal Value	106	10μF	107	100μF	<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%	<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> </table>		Rated DC Voltage		002	2.5Vdc	004	4Vdc	006	6.3Vdc	010	10Vdc	016	16Vdc	<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																						
ESR																																																																					
035	35mΩ																																																																				
070	70mΩ																																																																				
Nominal Capacitance																																																																					
Example	Nominal Value																																																																				
106	10μF																																																																				
107	100μF																																																																				
Capacitance Tolerance																																																																					
K	±10%																																																																				
M	±20%																																																																				
Rated DC Voltage																																																																					
002	2.5Vdc																																																																				
004	4Vdc																																																																				
006	6.3Vdc																																																																				
010	10Vdc																																																																				
016	16Vdc																																																																				
Internal Code																																																																					
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
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 [.157±.012]	2.40±0.10 [.094±.004]	1.30±0.30 [.051±.012]
W	7360-41	7.30±0.30 [.287±.012]	6.00±0.30 [.236±.012]	4.10±0.30 [.161±.012]	3.00±0.10 [.118±.004]	1.50±0.30 [.059±.012]
G2	8575-65	8.50±0.30 [.334±.012]	7.50±0.30 [.295±.012]	6.50±0.30 [.256±.012]	4.50±0.30 [.177±.012]	1.50±0.30 [.059±.012]

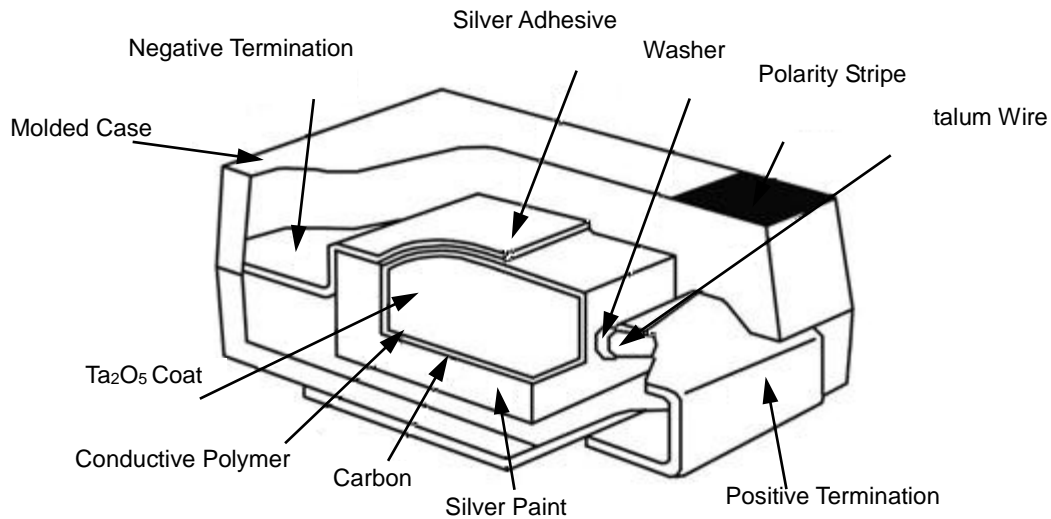
## TECHNICAL SPECIFICATION

Item	SPEC						Test Condition
Operating Temp	-55°C~+105°C						
C <sub>R</sub> Range	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	-55°C~+85°C
Category Voltage (V <sub>C</sub> )	2.0V	3.2V	5.0V	8.0V	12.8V	13.0V	105°C
Surge Voltage (V <sub>S</sub> )	3.2V	5.2V	8.2V	13V	20.8V	26.0V	-55°C~+85°C
Surge Voltage (V <sub>S</sub> )	2.6V	4.2V	6.5V	10.4V	16.6V	16.9V	105°C
Rated Voltage (V <sub>R</sub> )	25V	35V	50V	63V	75V	100V	-55°C~+85°C
Category Voltage (V <sub>C</sub> )	16.5V	23.0V	28.0V	34.0V	40.5V	54.0V	105°C
Surge Voltage (V <sub>S</sub> )	32.5V	45.5V	65.0V	69.0V	75.0V	100.0V	-55°C~+85°C
Surge Voltage (V <sub>S</sub> )	21.4V	29.0V	36.4V	36.4V	52.0V	60.0V	105°C

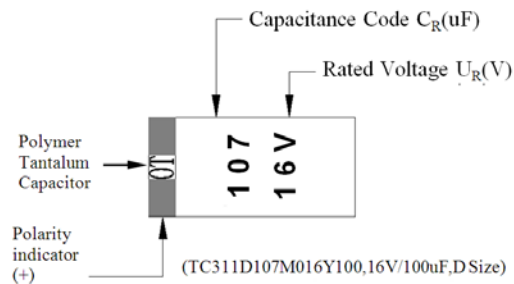
## STANDARD C-V VALUE BY CASE CODE

Rated Voltage (V <sub>R</sub> )	2.5	4	6.3	10	16	20	25	35	50	63	75	100	
Voltage Code	2V	4V	6V	10V	16V	20V	25V	35V	50V	63V	75V	100V	
C <sub>R</sub> (μF)	C Code	Case Code 壳号											
4.7	475								D	D/E	D	D/E	D/E
6.8	685								C/D	D/E	D	D/W	E/W
10	106		B	B	B	B/C/D	B/C/D	B/CD	C/DE	D/E	D/E	E/W	W
22	226		B/C	B/C	B/C	B/C	B/C/D	B/C/D	D/E	E/W	E/W		
33	336		B/C/D	B/C/D	B/C/D	B/C/D	C/D	D/E	D/E	E	W		
47	476		B/C/D	B/C/D	B/C/D	C/D	D/E	E/D	E	W			
68	686		B/C/D	B/C/D	B/C/D	C/D	D/E	E	E/W	W			
100	107		B/C/D	B/C/D	C/D/E	D/E	D/E	E		W			
150	157		D/E	D/E	D/E	D/E	E	E/W					
220	227		D/E	D/E	D/E	E	E/W	G2					
330	337		D/E	D/E	D/E	E							
470	477		D/E	D/E	E	W							
680	687	E	E	E		W							
1000	108	E		E									
3300	338	G2											

## CONSTRUCTION



## MARKINGS



B/C/D/E Case Marking

### Rated Voltage Code

Rated Voltage( V <sub>R</sub> )	2.5	4	6.3	10	16	20	25	35	50	63	75	100
Code	2V	4V	6V	10V	16V	20V	25V	35V	50V	63V	75V	100V

### Capacitance Code

Capacitance (μF)	4.7	6.8	10	22	33	47	68	100
Code (B/C/D/E/W/G2 Case)	475	685	106	226	336	476	686	107
Capacitance (μF)	150	220	330	470	680	1000	3300	
Code (B/C/D/E/W/G2 Case)	157	227	337	477	687	108	338	

# SPECIFICATIONS

## TC311 TYPE

Capacitance (μF)	Case	PartNumber	DCL (μA) +25°C Max	DF (%) +25°C 120Hz Max	ESR (mΩ) +25°C 100kHz Max
25V, +85°C (20V @ +105°C)					
680	E	TC311E687◎002□D70	170	12	70
1000	E	TC311E108◎002□D70	250	12	70
3300	G2	TC311G2338◎002□D70	825	12	70
4V, +85°C (32V @ +105°C)					
10	B	TC311B106◎004□150	4	10	150
15	B	TC311B156◎004□150	6	10	150
22	B	TC311B226◎004□150	8.8	10	150
22	C	TC311C226◎004□150	8.8	10	150
33	B	TC311B336◎004□150	13.2	10	150
33	C	TC311C336◎004□150	13.2	10	150
33	D	TC311D336◎004□200	13.2	10	200
47	B	TC311B476◎004□200	18.8	10	200
47	C	TC311C476◎004□150	18.8	10	150
47	D	TC311D476◎004□150	18.8	10	150
68	B	TC311B686◎004□150	27.2	10	150
68	C	TC311C686◎004□150	27.2	10	150
68	D	TC311D686◎004□150	27.2	10	150
100	B	TC311B107◎004□150	40	10	150
100	C	TC311C107◎004□150	40	10	150
100	D	TC311D107◎004□100	40	10	100
150	D	TC311D157◎004□100	60	12	100
150	E	TC311E157◎004□100	60	12	100
220	D	TC311D227◎004□100	88	12	100
220	E	TC311E227◎004□100	88	12	100
330	D	TC311D337◎004□100	132	12	100
330	E	TC311E337◎004□D90	132	12	90
470	D	TC311D477◎004□100	188	12	100
470	E	TC311E477◎004□D90	188	12	90
680	E	TC311E687◎004□D90	272	12	90

Capacitance (μF)	Case	PartNumber	DCL (μA) +25°C Max	DF (%) +25°C 120Hz Max	ESR (mΩ) +25°C 100kHz Max
63V, +85°C (5.0V @ +105°C)					
10	B	TC311B106◎006□350	6.3	10	350
15	B	TC311B156◎006□350	9.45	10	350
22	B	TC311B226◎006□200	13.86	10	200
22	C	TC311C226◎006□200	13.86	10	200
33	B	TC311B336◎006□200	20.79	10	200
33	C	TC311C336◎006□150	20.79	10	150
33	D	TC311D336◎006□150	20.79	10	150
47	B	TC311B476◎006□150	29.61	10	150
47	C	TC311C476◎006□150	29.61	10	150
47	D	TC311D476◎006□150	29.61	10	150
68	B	TC311B686◎006□150	42.84	10	150
68	C	TC311C686◎006□150	42.84	10	150
68	D	TC311D686◎006□150	42.84	10	150
100	B	TC311B107◎006□150	63	10	150
100	C	TC311C107◎006□150	63	10	150
100	D	TC311D107◎006□150	63	10	150
150	D	TC311D157◎006□100	94.5	12	100
150	E	TC311E157◎006□090	94.5	12	90
220	D	TC311D227◎006□090	138.6	12	90
220	E	TC311E227◎006□090	138.6	12	90
330	D	TC311D337◎006□090	207.9	12	90
330	E	TC311E337◎006□090	207.9	12	90
470	D	TC311D477◎006□090	296.1	12	90
470	E	TC311E477◎006□090	296.1	12	90
680	E	TC311E687◎006□090	428.4	12	90
1000	E	TC311E108◎006□090	630	12	90
10V, +85°C (8.0V @ +105°C)					
10	B	TC311B106◎010□150	10	10	150
15	B	TC311B156◎010□150	15	10	150

# SPECIFICATIONS

## TC311 TYPE

Capacitance (μF)	Case	PartNumber	DCL (μA) +25°C Max	DF (%) +25°C 120Hz Max	ESR (mΩ) +25°C 100kHz Max
10V, +85°C (8.0V @ +105°C)					
15	C	TC311E227◎004□100	15	10	150
22	B	TC311B226◎010□150	22	10	150
22	C	TC311C226◎010□150	22	10	150
33	B	TC311B336◎010□150	33	10	150
33	C	TC311C336◎010□150	33	10	150
33	D	TC311D336◎010□150	33	10	150
47	B	TC311B476◎010□150	47	10	150
47	C	TC311C476◎010□150	47	10	150
47	D	TC311D476◎010□150	47	10	150
68	B	TC311B686◎010□150	68	10	150
68	C	TC311C686◎010□150	68	10	150
68	D	TC311D686◎010□150	68	10	150
100	C	TC311C107◎010□150	100	10	150
100	D	TC311D107◎010□150	100	10	150
100	E	TC311E107◎010□150	100	10	150
150	D	TC311D157◎010□100	150	12	100
150	E	TC311E157◎010□090	150	12	90
220	D	TC311D227◎010□100	220	12	100
220	E	TC311E227◎010□090	220	12	90
330	D	TC311D337◎010□100	330	12	100
330	E	TC311E337◎010□090	330	12	90
470	E	TC311E477◎010□090	470	12	90

Capacitance (μF)	Case	PartNumber	DCL (μA) +25°C Max	DF (%) +25°C 120Hz Max	ESR (mΩ) +25°C 100kHz Max
16V, +85°C (12.8V @ +105°C)					
10	B	TC311B106◎016□150	16	10	150
10	C	TC311C106◎016□150	16	10	150
10	D	TC311D106◎016□150	16	10	150
15	B	TC311B156◎016□150	24	10	150
15	C	TC311C156◎016□150	24	10	150
22	B	TC311B226◎016□150	35.2	10	150
22	C	TC311C226◎016□150	35.2	10	150
33	B	TC311B336◎016□150	52.8	10	150
33	C	TC311C336◎016□150	52.8	10	150
33	D	TC311D336◎016□150	52.8	10	150
47	C	TC311C476◎016□150	75.2	10	150
47	D	TC311D476◎016□150	75.2	10	150
68	C	TC311C686◎016□150	108.8	10	150
68	D	TC311D686◎016□150	108.8	10	150
100	D	TC311D107◎016□100	160	10	100
100	E	TC311E107◎016□090	160	10	90
150	D	TC311D157◎016□100	240	12	100
150	E	TC311E157◎016□090	240	12	90
220	E	TC311E227◎016□090	352	12	90
330	E	TC311E337◎016□090	528	12	90
330	W	TC311W337◎016□070	528	12	70
470	W	TC311W477◎016□070	752	12	70

# SPECIFICATIONS

## TC312 TYPE

Capacitance (μF)	Case	PartNumber	DCL (μA) +25°C Max	DF (%) +25°C 120Hz Max	ESR (mΩ) +25°C 100kHz Max
20V, +85°C (16V @ +105°C)					
10	B	TC312B106◎020□150	20	10	150
10	C	TC312C106◎020□150	20	10	150
10	D	TC312D106◎020□150	20	10	150
15	B	TC312B156◎020□150	30	10	150
15	C	TC312C156◎020□150	30	10	150
15	D	TC312D156◎020□150	30	10	150
22	B	TC312B226◎020□150	44	10	150
22	C	TC312C226◎020□150	44	10	150
22	D	TC312D226◎020□150	44	10	150
33	C	TC312C336◎020□150	66	10	150
33	D	TC312D336◎020□150	66	10	150
47	D	TC312D476◎020□150	94	10	150
47	E	TC312E476◎020□100	94	10	100
68	D	TC312D686◎020□150	136	10	150
68	E	TC312E686◎020□100	136	10	100
100	D	TC312D107◎020□070	200	10	70
100	E	TC312E107◎020□070	200	10	70
150	E	TC312E157◎020□070	300	12	70
220	E	TC312E227◎020□070	440	12	70
220	W	TC312W227◎020□070	440	12	70
330	W	TC312W337◎020□070	660	12	70
25V, +85°C (20V @ +105°C)					
10	B	TC312B106◎025□200	25	10	200
10	C	TC312C106◎025□150	25	10	150
10	D	TC312D106◎025□150	25	10	150
15	B	TC312B156◎025□150	37.5	10	150
15	C	TC312C156◎025□150	37.5	10	150
15	D	TC312D156◎025□150	37.5	10	150
22	B	TC312B226◎025□150	55	10	150
22	C	TC312C226◎025□150	55	10	150

Capacitance (μF)	Case	PartNumber	DCL (μA) +25°C Max	DF (%) +25°C 120Hz Max	ESR (mΩ) +25°C 100kHz Max
25V, +85°C (20V @ +105°C)					
22	D	TC312D226◎025□150	55	10	150
33	D	TC312D336◎025□150	82.5	10	150
33	E	TC312E336◎025□100	82.5	10	100
47	E	TC312E476◎025□100	117.5	10	100
47	D	TC312D476◎025□150	117.5	10	150
68	E	TC312E686◎025□100	170	10	100
100	E	TC312E107◎025□090	250	10	90
150	E	TC312E157◎025□090	375	12	90
150	W	TC312W157◎025□090	375	12	90
330	G2	TC312G2337◎025□090	825	12	90
35V, +85°C (28V @ +105°C)					
4.7	D	TC312D475◎035□200	16.5	10	200
6.8	C	TC312C685◎035□200	23.8	10	200
6.8	D	TC312D685◎035□200	23.8	10	200
10	C	TC312C106◎035□200	35	10	200
10	D	TC312D106◎035□200	35	10	200
10	E	TC312E106◎035□150	35	10	150
15	D	TC312D156◎035□200	52.5	10	200
15	E	TC312E156◎035□150	52.5	10	150
22	D	TC312D226◎035□150	77	10	150
22	E	TC312E226◎035□150	77	10	150
33	D	TC312D336◎035□200	115.5	10	200
33	E	TC312E336◎035□150	115.5	10	150
47	E	TC312E476◎035□150	164.5	10	150
68	E	TC312E686◎035□150	238	10	150
68	W	TC312W686◎035□090	238	10	90
50V, +85°C (35.0V @ +105°C)					
4.7	D	TC312D475◎050□300	23.5	10	300
4.7	E	TC312E475◎050□300	23.5	10	300
6.8	D	TC312D685◎050□300	34	10	300

# SPECIFICATIONS

## TC312 TYPE

Capacitance (μF)	Case	PartNumber	DCL (μA) +25°C Max	DF (%) +25°C 120Hz Max	ESR (mΩ) +25°C 100kHz Max
50V, +85°C (35.0V @ +105°C)					
6.8	E	TC312E685◎050□200	34	10	200
10	D	TC312D106◎050□300	50	10	300
10	E	TC312E106◎050□200	50	10	200
15	D	TC312D156◎050□300	75	10	300
15	E	TC312E156◎050□200	75	10	200
22	E	TC312E226◎050□150	110	10	150
22	W	TC312W226◎050□150	110	10	150
33	E	TC312E336◎050□150	165	10	150
47	W	TC312W476◎050□150	235	10	150
68	W	TC312W686◎050□150	340	10	150
75	W	TC312W756◎050□100	375	10	100
100	W	TC312W107◎050□100	500	12	100
63V, +85°C (42V @ +105°C)					
3.3	D	TC312D335◎063□300	20.8	10	350
4.7	D	TC312D475◎063□300	29.6	10	350
6.8	D	TC312D685◎063□300	42.8	10	350
10	D	TC312D106◎063□300	63	10	300
10	E	TC312E106◎063□200	63	10	200
15	E	TC312E156◎063□200	94.5	10	200

Capacitance (μF)	Case	PartNumber	DCL (μA) +25°C Max	DF (%) +25°C 120Hz Max	ESR (mΩ) +25°C 100kHz Max
63V, +85°C (42V @ +105°C)					
22	E	TC312E226◎063□200	138.6	10	200
22	W	TC312W226◎063□200	138.6	10	200
33	W	TC312W336◎063□200	207.9	10	200
75V, +85°C (50.0V @ +105°C)					
3.3	D	TC312D335◎075□500	24.8	10	500
4.7	D	TC312D475◎075□500	35.3	10	500
4.7	E	TC312E475◎075□500	35.3	10	500
6.8	D	TC312D685◎075□500	51	10	500
6.8	W	TC312W685◎075□400	51	10	400
10	E	TC312E106◎075□350	75	10	350
10	W	TC312W106◎075□350	75	10	350
15	W	TC312W156◎075□350	112.5	10	350
100V, +85°C (60.0V @ +105°C)					
3.3	D	TC312D335◎100□500	33	10	500
4.7	D	TC312D335◎100□500	33	10	500
4.7	E	TC312E335◎100□500	33	10	500
6.8	E	TC312E685◎100□500	33	10	500
6.8	W	TC312W685◎100□500	33	10	500
10	W	TC312W106◎100□500	33	10	500

※◎: Please specify the capacitance tolerance code (K=±10%, M=±20%)

※□: Please specify the internal code (B=Black molded case, Laser marking; Y=Yellow molded case, Laser marking.)