



Passive Devices

Tantalum Capacitors

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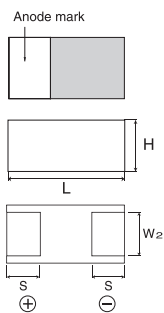
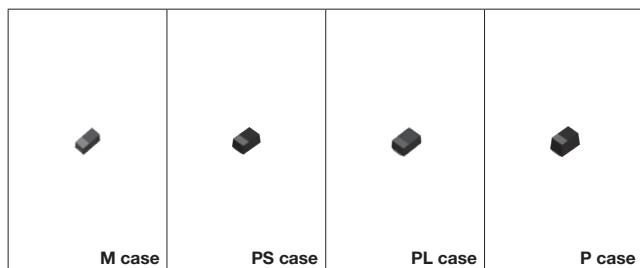
Tantalum Capacitors

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 - P case : 2012-12(0805)size
 - A case : 3216-18(1206)size

Conductive Polymer New Bottom Surface Electrode(Extra Large Capacitance) : TCSO series

- M case : 1608-10(0603)size
- PS case : 2012-09(0805)Ultra-Low Profile size
- PL case : 2012-10(0805)Low Profile size
- P case : 2012-12(0805)size

■ Dimensions



(Unit : mm)

Dimensions	Size			
	M case	PS case	PL case	P case
L	1.6+0.2/-0	2.0±0.2	2.0±0.2	2.0±0.2
W ¹	0.85±0.1	1.25±0.2	1.25±0.2	1.25±0.2
W ²	0.55±0.1	0.85±0.2	0.85±0.2	0.85±0.2
H	0.8+0.2/-0	0.8±0.1	0.9±0.1	Max. 1.2
S	0.5±0.1	0.5±0.1	0.5±0.1	0.5±0.1

Series Name	Case Name	Capacitance Tolerance	Operating Temperature	Tangent of Loss Angle	Leakage Current	ESR
TCSO series	M case 1608-10 (0603)size	±20%(M)	-55°C to +105°C Rated Voltage at -55°C to +85°C DeRated Voltage at +85°C to +105°C	Max. 15% at 120Hz(25°C)*	Max. 0.1 CV (25°C, 5 min.)	Max. 300mΩ(at 100kHz)*
	PS case 2012-09 (0805)Ultra-Low Profile size					Max. 500mΩ(at 100kHz)*
	PL case 2012-10 (0805)Low Profile size					Max. 500mΩ(at 100kHz)*
	P case 2012-12 (0805)size					Max. 200mΩ(at 100kHz)*

*Spec. values are specified for each parts number.

■ Capacitance Range

- M case : 1608-10(0603)size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)			
	2.5	4	6.3	10
10 (106)				☆300
22 (226)			300	
47 (476)			300	

☆:Under Development

- PS case : 2012-09(0805)Ultra-Low Profile size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)						
	4	6.3	8	10	16	25	35
1 (105)							☆500
2.2 (225)							
4.7 (475)							
10 (106)							
22 (226)				☆200			
47 (476)		150/200	150/200				
100 (107)							

☆:Under Development

- PL case : 2012-10(0805)Low Profile size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)					
	4	6.3	10	16	20	25
4.7 (475)						500
10 (106)						
22 (226)			200			
33 (336)			☆200			
47 (476)		150/200				
68 (686)		☆150/☆200				

☆:Under Development

- P case : 2012-12(0805)size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)			
	4	6.3	10	16
10 (106)				
22 (226)				
47 (476)			☆200	
100 (107)				

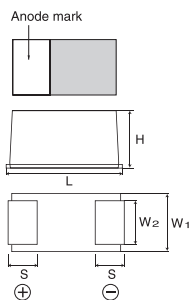
☆:Under Development

*Usage precaution : Based on JEITA Technical Report "EIAJ RCR-2368A"

Conductive Polymer Bottom Surface Electrode(Large Capacitance) : TCTO series

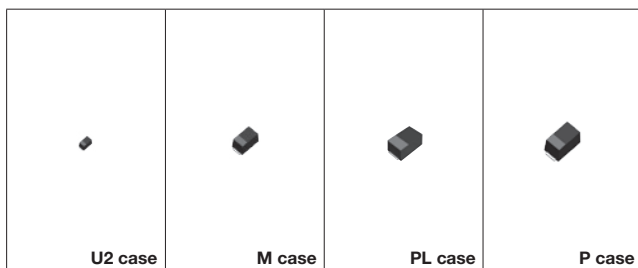
- U2 case : 1005-064(0402)size
- M case : 1608-09(0603)size
- PL case : 2012-10(0805)Low Profile size
- P case : 2012-12(0805)size

Dimensions



(Unit : mm)

Dimensions	Size			
	U2 case	M case	PL case	P case
L	1.0+0.3/-0	1.6±0.1	2.0±0.2	2.0±0.2
W ₁	0.5+0.2/-0	0.85±0.1	1.25±0.2	1.25±0.2
W ₂	0.35±0.1	0.55±0.1	0.85±0.2	0.85±0.2
H	Max. 0.64	0.8±0.1	0.9±0.1	Max. 1.2
S	0.35±0.1	0.5±0.1	0.5±0.2	0.5±0.2



Series Name	Case Name	Capacitance Tolerance	Operating Temperature	Tangent of Loss Angle	Leakage Current	ESR
TCTO series	U2 case 1005-064 (0402)size	±20%(M)	-55°C to +105°C Rated Voltage at -55°C to +85°C DeRated Voltage at +85°C to +105°C	Max. 30% at 120Hz(25°C)*	3μA or 0.1CV whichever is greater (25°C, 5 min.)	Max. 700mΩ(at 100kHz)*
	M case 1608-09 (0603)size			Max. 8% at 120Hz(25°C)*	Max. 0.1CV (25°C, 5 min.)	Max. 500mΩ(at 100kHz)*
	PL case 2012-10 (0805)Low Profile size			Max. 15% at 120Hz(25°C)*	3μA or 0.1CV whichever is greater (25°C, 5 min.)	Max. 300mΩ(at 100kHz)*
	P case 2012-12 (0805)size					

*Spec. values are specified for each parts number.

Capacitance Range

● U2 case : 1005-064(0402)size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)			
	2.5	4	6.3	10
0.47 (474)				
1 (105)				
2.2 (225)				
4.7 (475)			☆700	

☆:Under Development

● M case : 1608-09(0603)size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)			
	2.5	4	6.3	10
2.2 (225)				500
3.3 (335)				500
4.7 (475)				500
10 (106)			☆500	

☆:Under Development

● PL case : 2012-10(0805)Low Profile size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)			
	2.5	4	6.3	10
10 (106)			☆300	
22 (226)			300	
47 (476)				
100 (107)				

☆:Under Development

● P case : 2012-12(0805)size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)			
	2.5	4	6.3	10
10 (106)				300
22 (226)				☆300
47 (476)		300		
100 (107)				

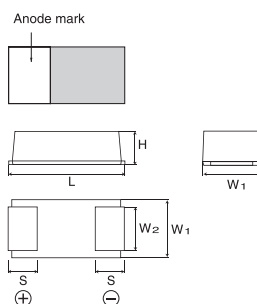
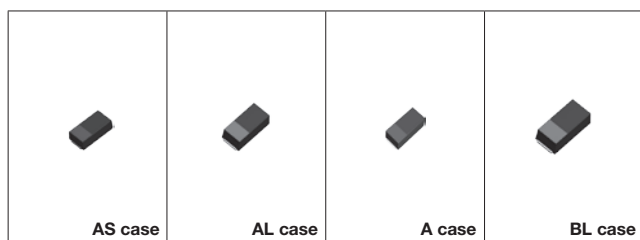
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*Usage precaution : Based on JEITA Technical Report "EIAJ RCR-2368A"

Conductive Polymer Bottom Surface Electrode(Large Capacitance) : TCTO series

- AS case : 3216-10(1206)Ultra-Low Profile size
- AL case : 3216-12(1206)Low Profile size
- A case : 3216-18(1206)size
- BL case : 3528-12(1411)Low Profile size

■ Dimensions



(Unit : mm)

Dimensions	Size			
	AS case	AL case	A case	BL case
L	3.2±0.2	3.2±0.2	3.2±0.2	3.5±0.2
W ¹	1.6±0.2	1.6±0.2	1.6±0.2	2.8±0.2
W ²	1.2±0.2	1.2±0.2	1.2±0.2	2.0±0.2
H	0.9±0.1	1.1±0.1	1.6±0.2	1.1±0.1
S	0.8±0.2	0.8±0.2	0.8±0.2	0.8±0.2

Series Name	Case Name	Capacitance Tolerance	Operating Temperature	Tangent of Loss Angle	Leakage Current	ESR
TCTO series	AS case 3216-10 (1206)Ultra-Low Profile size	±20%(M)	-55°C to +105°C Rated Voltage at -55°C to +85°C DeRated Voltage at +85°C to +105°C	Max. 10% at 120Hz(25°C)*	3μA or 0.1CV whichever is greater (25°C, 5 min.)	Max. 200mΩ(at 100kHz)*
	AL case 3216-12 (1206)Low Profile size					Max. 400mΩ(at 100kHz)*
	A case 3216-18 (1206)size			Max. 15% at 120Hz(25°C)*	Max. 0.1CV (25°C, 5 min.)	Max. 200mΩ(at 100kHz)*
	BL case 3528-12 (1411)Low Profile size				Max. 0.2CV (25°C, 5 min.)	Max. 150mΩ(at 100kHz)*

*Spec. values are specified for each parts number.

■ Capacitance Range

- AS case : 3216-10(1206)Ultra-Low Profile size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)			
	4	6.3	10	16
22 (226)				
47 (476)		200	100/200	
100 (107)		55/70		

- AL case : 3216-12(1206)Low Profile size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V)				
	4	6.3	10	16	20
22 (226)			200	☆400	☆400
33 (336)			200		
47 (476)		70/200			
100 (107)	200	70/200			

☆:Under Development

- A case : 3216-18(1206)size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V)			
	2.5	6.3	10	16
10 (106)				☆200
47 (476)			200	
100 (107)		☆35/45/70		
150 (157)		☆35/200		
220 (227)	35			
330 (337)	☆35/☆200			

☆:Under Development

- BL case : 3528-12(1411)Low Profile size

(ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)							
	2	2.5	4	6.3	10	16	25	35
6.8 (685)								150
10 (106)							☆100	☆150
15 (156)							☆100	
22 (226)							☆100	
33 (336)						70		
47 (476)					☆70	☆70		
100 (107)				☆25/☆35				
150 (157)				25/35				
220 (227)				☆25/☆35				
330 (337)		☆15	☆25/☆35/☆45					
470 (477)	☆15							

☆:Under Development

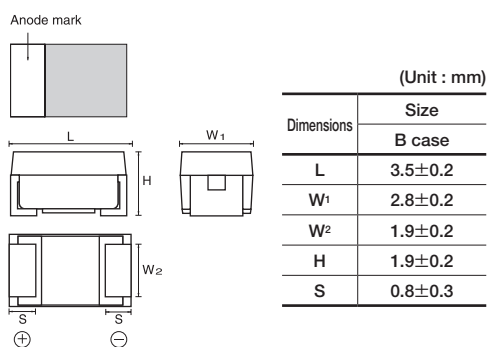
*Usage precaution : Based on JEITA Technical Report "EIAJ RCR-2368A"

Conductive Polymer Standard : TCO series

■ B case : 3528-21(1411)size



■ Dimensions



Series Name	Case Name	Capacitance Tolerance	Operating Temperature	Tangent of Loss Angle	Leakage Current	ESR
TCO series	B case 3528-21 (1411)size	±20%(M)	-55°C to +105°C Rated Voltage at -55°C to +85°C DeRated Voltage at +85°C to +105°C	Max. 15% at 120Hz(25°C)*	Max. 0.1CV (25°C, 5 min.)	Max. 150mΩ(at 100kHz)*

*Spec. values are specified for each parts number.

■ Capacitance Range

● B case : 3528-21(1411)size

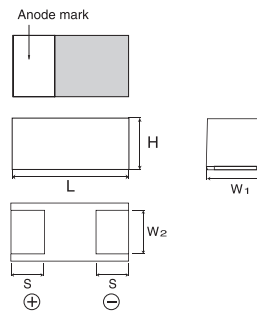
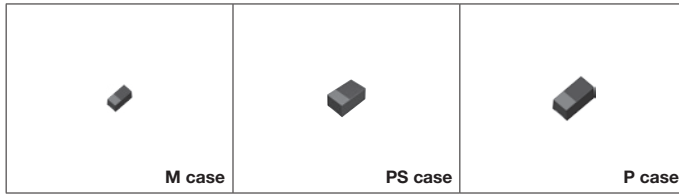
(ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)					
	2.5	4	6.3	10	16	25
15 (156)						100
33 (336)				150	100	
47 (476)			70	150		
100 (107)			35/45			
150 (157)			35/45			
220 (227)	35		35/45			
330 (337)	35/45					

New Bottom Surface Electrode(Extra Large Capacitance) : TCS series

- M case : 1608-10(0603)size
- PS case : 2012-09(0805)Ultra-Low Profile size
- P case : 2012-12(0805)size

■ Dimensions



(Unit : mm)

Dimensions	Size		
	M case	PS case	P case
L	1.6+0.2/-0	2.0±0.2	2.0±0.2
W ¹	0.85±0.1	1.25±0.2	1.25±0.2
W ²	0.55±0.1	0.85±0.2	0.85±0.2
H	0.8+0.2/-0	Max. 0.9	Max. 1.2
S	0.5±0.1	0.5±0.1	0.5±0.1

Series Name	Case Name	Capacitance Tolerance	Operating Temperature	Tangent of Loss Angle	Leakage Current	ESR
TCS series	M case 1608-10 (0603)size	±20%(M)	-55°C to +125°C Rated Voltage at -55°C to +85°C DeRated Voltage at +85°C to +125°C	Max. 40% at 120Hz(25°C)*	Max. 0.2CV (25°C, 5 min.)*	Max. 6.0Ω(at 100kHz)*
	PS case 2012-09 (0805) Ultra-Low Profile size				Max. 0.1CV (25°C, 5 min.)*	
	P case 2012-12 (0805)size					

*Spec. values are specified for each parts number.

■ Capacitance Range

● M case : 1608-10(0603)size

Capacitance (μF)	Rated Voltage(V.DC)			
	4	6.3	10	16
10 (106)				M
22 (226)			M	
47 (476)		M		
100 (107)	M			

● PS case : 2012-09(0805)Ultra-Low Profile size

Capacitance (μF)	Rated Voltage(V.DC)			
	4	6.3	10	16
22 (226)				
47 (476)			PS	
100 (107)				
220 (227)				

● P case : 2012-12(0805)size

Capacitance (μF)	Rated Voltage(V.DC)			
	4	6.3	10	20
10 (106)				P
47 (476)			P	
100 (107)		P		
150 (157)		P		
220 (227)	P			

*Usage precaution : Based on JEITA Technical Report "EIAJ RCR-2368A"

▶ Bottom Surface Electrode(Large Capacitance) : TCT, TC series

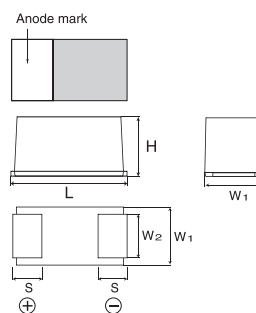
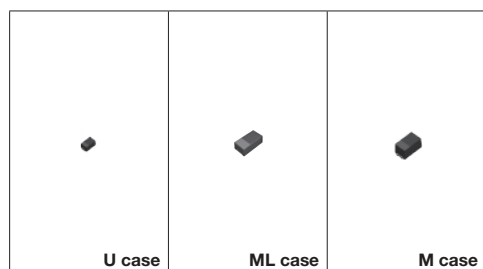
Bottom Surface Electrode(Large Capacitance) : TCT, TC series

■ U case : 1005-055(0402)size

■ ML case : 1608-06(0603)Low Profile size

■ M case : 1608-09(0603)size

■ Dimensions



(Unit : mm)

Dimensions	Size		
	U case	ML case	M case
L	1.0+0.2/-0	1.6±0.1	1.6±0.1
W ¹	0.5+0.2/-0	0.85±0.1	0.85±0.1
W ²	0.35±0.1	0.55±0.1	0.55±0.1
H	Max. 0.55	0.55±0.1	0.8±0.1
S	0.35±0.1	0.5±0.1	0.5±0.1

Series Name	Case Name	Capacitance Tolerance	Operating Temperature	Tangent of Loss Angle	Leakage Current	ESR
TCT series	U case 1005-055 (0402)size	±10%(K) ±20%(M)	-55°C to +125°C Rated Voltage at -55°C to +85°C DeRated Voltage at +85°C to +125°C	Max. 50% at 120Hz(25°C)*	0.5μA or 0.1CV whichever is greater (25°C, 5 min.)*	Max. 35.0Ω(at 100kHz)*
	ML case 1608-06 (0603)Low Profile size	±20%(M)		Max. 30% at 120Hz(25°C)*		Max. 15.0Ω(at 100kHz)*
TC series	M case 1608-09 (0603)size				0.5μA or 0.01CV whichever is greater (25°C, 5 min.)*	

*Spec. values are specified for each parts number.

■ Capacitance Range

● U case : 1005-055(0402)size

Capacitance (μF)	Rated Voltage(V.DC)					
	2.5	4	6.3	10	16	20
0.33 (334)						U
0.47 (474)			U			
1 (105)			U	☆U	☆U	
2.2 (225)			U			
4.7 (475)		U	U			
10 (106)		☆U				
15 (156)	U					

☆:Under Development

● ML case 1608-06(0603)Low Profile size

Capacitance (μF)	Rated Voltage(V.DC)					
	4	6.3	10	16	20	25
1 (105)						ML
2.2 (225)						
4.7 (475)						
10 (106)						
22 (226)						

● M case : 1608-09(0603)size

Capacitance (μF)	Rated Voltage(V.DC)					
	4	6.3	10	16	20	25
1 (105)				M		M
2.2 (225)			M	M		
4.7 (475)		M	M			
10 (106)	M	M	M			
22 (226)	M	M				
33 (336)	☆M	M				

☆:Under Development

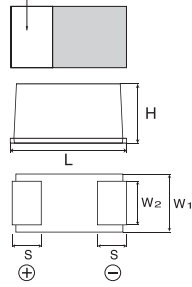
*Usage precaution : Based on JEITA Technical Report "EIAJ RCR-2368A"

Bottom Surface Electrode(Large Capacitance) : TCT series

- PL case : 2012-10(0805)Low Profile size
- P case : 2012-12(0805)size
- AS case : 3216-10(1206)Ultra-Low Profile size
- AL case : 3216-12(1206)Low Profile size

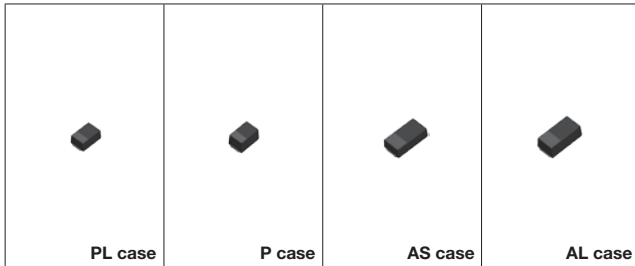
■ Dimensions

Anode mark



(Unit : mm)

Dimensions	Size			
	PL case	P case	AS case	AL case
L	2.0±0.2	2.0±0.2	3.2±0.2	3.2±0.2
W ¹	1.25±0.2	1.25±0.2	1.6±0.2	1.6±0.2
W ²	0.85±0.2	0.85±0.2	1.2±0.2	1.2±0.2
H	0.9±0.1	Max. 1.2	0.9±0.1	1.1±0.1
S	0.5±0.2	0.5±0.2	0.8±0.2	0.8±0.2



Series Name	Case Name	Capacitance Tolerance	Operating Temperature	Tangent of Loss Angle	Leakage Current	ESR
TCT series	PL case 2012-10 (0805)Low Profile size	±20%(M)	-55°C to +125°C Rated Voltage at -55°C to +85°C DeRated Voltage at +85°C to +125°C	Max. 30% at 120Hz(25°C)*	Max. 0.05CV (25°C, 5 min.)*	Max. 8.0Ω (at 100kHz)*
	P case 2012-12 (0805)size					
	AS case 3216-10 (1206)Ultra-Low Profile size					
	AL case 3216-12 (1206)Low Profile size					

*Spec. values are specified for each parts number.

■ Capacitance Range

● PL case : 2012-10(0805)Low Profile size

● P case : 2012-12(0805)size

Capacitance (μF)	Rated Voltage(V.DC)				
	4	6.3	10	16	20
1 (105)					
2.2 (225)					
4.7 (475)					☆PL
10 (106)				PL	
22 (226)			PL		
33 (336)			☆PL		
47 (476)		PL			
100 (107)	PL				

☆:Under Development

Capacitance (μF)	Rated Voltage(V.DC)					
	4	6.3	10	16	20	25
2.2 (225)						P
4.7 (475)						
10 (106)				P		
22 (226)			P			
33 (336)			P			
47 (476)	P	P	☆P			
100 (107)	P					

☆:Under Development

● AS case : 3216-10(1206)Ultra-Low Profile size

● AL case : 3216-12(1206)Low Profile size

Capacitance (μF)	Rated Voltage(V.DC)						
	4	6.3	10	16	20	25	35
1 (105)							AS
2.2 (225)							☆AS
4.7 (475)						☆AS	
10 (106)					☆AS		
22 (226)				☆AS			
33 (336)			☆AS				
47 (476)		AS	AS				
100 (107)		AS					
220 (227)	AS						

☆:Under Development

Capacitance (μF)	Rated Voltage(V.DC)							
	2.5	4	6.3	10	16	20	25	35
3.3 (335)								AL
4.7 (475)							AL	
10 (106)						AL		
22 (226)					AL	AL		
33 (336)					AL			
47 (476)				AL				
100 (107)			AL	☆AL				
150 (157)			AL					
220 (227)		AL	☆AL					
330 (337)	☆AL							

☆:Under Development

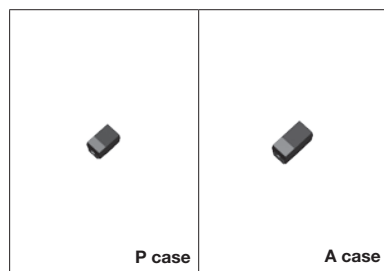
*Usage precaution : Based on JEITA Technical Report "EIAJ RCR-2368A"

▶ Standard : TC series

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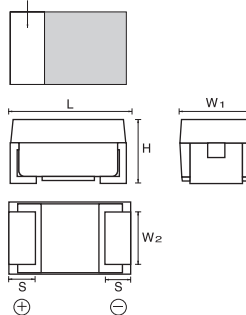
■ P case : 2012-12(0805)size

■ A case : 3216-18(1206)size



Dimensions

Anode mark



(Unit : mm)

Dimensions	Size	
	P case	A case
L	2.0±0.2	3.2±0.2
W ¹	1.25±0.2	1.6±0.2
W ²	0.9±0.2	1.2±0.2
H	Max. 1.2	1.6±0.2
S	0.45±0.3	0.8±0.3

Series Name	Case Name	Capacitance Tolerance	Operating Temperature	Tangent of Loss Angle	Leakage Current	ESR
TC series	P case 2012-12 (0805)size	±20%(M)	-55°C to +125°C Rated Voltage at -55°C to +85°C DeRated Voltage at +85°C to +125°C	Max. 25% at 120Hz(25°C)*	0.5μA or 0.01CV whichever is greater (25°C, 1 min.)*	Max. 17.5Ω(at 100kHz)*
	A case 3216-18 (1206)size			Max. 30% at 120Hz(25°C)*		Max. 8.8Ω(at 100kHz)*

*Spec. values are specified for each parts number.

Capacitance Range

● P case : 2012-12(0805)size

Capacitance (μF)	Rated Voltage(V.DC)					
	4	6.3	10	16	20	25
1 (105)			P	P		P
2.2 (225)		P	P			
4.7 (475)		P	P			
10 (106)	P		P			
22 (226)	P	P				

● A case : 3216-18(1206)size

Capacitance (μF)	Rated Voltage(V.DC)					
	4	6.3	10	16	20	25
1 (105)					A	A
4.7 (475)				A	A	A
10 (106)			A	A		
22 (226)			A			
47 (476)		A				
100 (107)	A					

D

Tantalum Capacitors

*Usage precaution : Based on JEITA Technical Report "EIAJ RCR-2368A"

● Part Number Explanation

■ Conductive Polymer Capacitors

T	C	S	O	M	0	J	4	7	6	M	8	R	—	Z	M	1																																																																																											
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● Package Quantity

■ Conductive Polymer Capacitors

Case(mm[inch])	Series	Package Quantity(pcs)
U2(1005-064[0402])	TCTO	10,000
M(1608-09[0603])		4,000
PS(2012-09[0805] Ultra-Low Profile)	TCSO	3,000
PL(2012-10[0805] Low Profile)		
P(2012-12[0805])		
AS(3216-10[1206] Ultra-Low Profile)	TCTO	2,000
AL(3216-12[1206] Low Profile)		
A(3216-18[1206])		
BL(3528-12[1411] Low Profile)		
B(3528-21[1411])	TCO	2,000

■ Tantalum Capacitors

Case(mm[inch])	Series	Package Quantity(pcs)
U(1005-055[0402])	TCT	10,000
ML(1608-065[0603] Low Profile)		5,000
M(1608-09[0603])	TC	4,000
M(1608-10[0603])	TCS	3,000
PS(2012-09[0805] Ultra-Low Profile)		
PL(2012-10[0805] Low Profile)		
P(2012-12[0805])	TCS/TCT/TC	3,000
AS(3216-10[1206] Ultra-Low Profile)	TCT	
AL(3216-12[1206] Low Profile)		TC
A(3216-18[1206])	2,000	