

Kingtronics®

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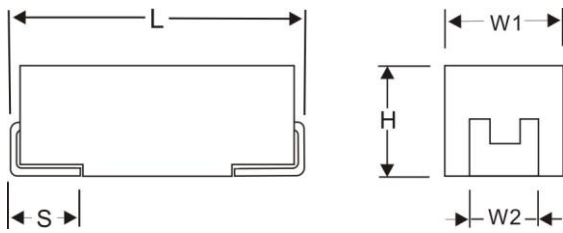
Chip Tantalum Capacitor

Low ESR – SMD



FEATURES

- Low ESR, Volumetrically efficient, Stable in electrical & storage performances, Long lifespan, High reliability.
- Laser-mark Case
- Epoxy molded encapsulation, Chip, Easy for integration, Polarized.
- Typical applications include decoupling and filtering in industrial and automotive end applications, such as DC/DC converters, portable electronics, telecommunications and control units.



Dimensions (Unit: mm)

Case	EIA Code	L	W ₁	H	S	W ₂
A	1206	3.2±0.2	1.6±0.2	1.6±0.2	0.8±0.2	1.2±0.2
B	1210	3.5±0.2	2.8±0.2	1.9±0.2	0.8±0.2	2.2±0.2
C	2312	6.0±0.2	3.2±0.2	2.5±0.2	1.3±0.2	2.2±0.2
D	2917	7.3±0.2	4.3±0.2	2.8±0.2	1.3±0.2	2.4±0.2
E	2917	7.3±0.4	4.3±0.4	4.1±0.4	1.3±0.2	2.4±0.2
V	2924	7.3±0.4	6.1±0.4	3.6±0.4	1.35±0.2	3.0±0.2

Technical Specifications

Technical Data	All technical data relate to an ambient temperature of +25°C									
Capacitance Range	0.47µF ~ 1000µF									
Capacitance Tolerance	±10% ; ±20%									
Rated Voltage (V _R)	≤+85°C:	4	6.3	10	16	20	25	35	50	63
Category Voltage (V _C)	≤+125°C:	2.7	4	6.3	10	15	17	23	33	40
Surge Voltage (V _S)	≤+85°C:	5.2	8	13	20	26	32	46	65	82
Surge Voltage (V _S)	≤+125°C:	3.4	5	8	13	16	20	28	40	50
Temperature Range	-55°C to +125°C									
Termination Finished	Sn Plating (standard), Gold and SnPb Plating upon request									

Capacitance And Rated Voltage Range (Letter Denotes Case Size)

Rated Voltage(V)	4	6.3	10	16
Capacitance(µF)	Case Size & ESR			
6.8	A(2000,2500),B(1200,2000)			
10	A(1700),B(1200,2000)			
15	A(1000,1800),B(600,900)			
22	A(1200,1500),B(400,500)			
33	B(700,1000),C(500,700),D(500)			
47	A(1500,2000),B(900,1500)	A(1500,2000),B(600)	B(450,700),C(400,600),D(300,500)	C(500,700),D(300,500)
68	B(1000,1500),C(600,C(1000)	B(600,800),C(300,500)	B(500,700),C(400,600),D(300,500)	C(300,500),D(300,500),E(200,600)
100	B(1000,1500),C(600,C(1000)	B(500,700),C(500,700),D(250,500)	C(200,500),D(150,400)	C(1000),D(200,450),E(200,600)
150	B(450,800),C(500,1000)	B(400,700),C(300,500),D(300,500)	C(250,500),D(200,400),E(150)	C(800),D(200,500),E(200,600)
220	C(500,900),D(350,700),E(200,600)	C(300,500),D(300,500),E(150,300)	D(200,400),E(150,300)	D(500,600),E(200,250)
330	C(500,900),D(300,600),E(100,500)	C(200,500),D(150,300),E(150,300)	D(200,400),E(200,400),V(200,400)	E(200,400),V(200,400)
470	D(400,600),E(200,600),V(200,600)	D(150,300),E(150,300)	D(150,250),E(150,200),V(150,200)	E(180,500),V(180,500)
680	D(200,350),E(150,350),V(150,350)	E(150,300)	E(150,200)	E(450,600)
1000	E(150,200)	E(150,300)	E(150,200)	

Rated Voltage(V)	20	25	35	50	63
Capacitance(µF)	Case Size & ESR				
0.47	A(4000,A(8000)				
0.68	A(6000,A(7000)				
1	A(6000,7000),B(2500,3000)				
1.5	B(2500,4000),C(1800,4000)				
2.2	C(1800,3000),D(1000,2500)				
3.3	B(2500,3000),C(2000,2500)				
4.7	B(2500,3000),C(1200,2000)				
6.8	C(700,1500),D(700,1500)				
10	C(700,1500),D(700,1500)				
15	B(2000,2500),C(800,1000),D(700,1000)				
22	C(700,1000),D(600,1000)				
33	D(600,800),E(500,1000)				
47	D(600,800),E(500,1000)				
68	B(1000,1800),C(800,1200)				
100	B(1200,1800),C(600,1000),D(500,1000)				
150	B(1500,2000),C(900,1200),D(450,800)				
220	C(700,1000),D(400,800)				
330	D(400,600),E(400,800)				
470	E(400,500)				
680	E(400,500)				
1000	V(300)				
1500	V(300)				
2200	V(300)				
3300	V(300)				

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Low ESR – SMD

Rated Voltage (V)	Rated CAP (μF)	Case Code	Rated Temp (°C)	Category Temp (°C)	Category Voltage (V)	Max DCL (μA) @25°C	Max DF(%) @25°C 100Hz	Max ESR (mΩ) @25°C 100KHz	Max Ripple @100kHz IRMS(A)		
									25°C	85°C	125°C
4	47	A	85	125	2.7	1.9	11	1500	0.208	0.125	0.083
		A	85	125	2.7	1.9	11	2000	0.180	0.108	0.072
		B	85	125	2.7	1.9	8	900	0.289	0.173	0.115
		B	85	125	2.7	1.9	8	1500	0.224	0.134	0.089
	68	B	85	125	2.7	2.7	8	1000	0.274	0.164	0.110
		B	85	125	2.7	2.7	8	1500	0.224	0.134	0.089
		C	85	125	2.7	2.7	6	600	0.387	0.232	0.155
		C	85	125	2.7	2.7	6	1000	0.300	0.180	0.120
	100	B	85	125	2.7	4.0	10	450	0.408	0.245	0.163
		B	85	125	2.7	4.0	10	800	0.306	0.184	0.122
		C	85	125	2.7	4.0	10	500	0.424	0.255	0.170
		C	85	125	2.7	4.0	10	1000	0.300	0.180	0.120
	150	C	85	125	2.7	6.0	10	500	0.424	0.255	0.170
		C	85	125	2.7	6.0	10	900	0.316	0.190	0.126
		D	85	125	2.7	6.0	8	350	0.548	0.329	0.219
		D	85	125	2.7	6.0	8	700	0.387	0.232	0.155
		E	85	125	2.7	6.0	8	200	0.791	0.474	0.316
		E	85	125	2.7	6.0	8	600	0.456	0.274	0.183
	220	C	85	125	2.7	8.8	12	500	0.424	0.255	0.170
		C	85	125	2.7	8.8	12	900	0.316	0.190	0.126
		D	85	125	2.7	8.8	10	300	0.592	0.355	0.237
		D	85	125	2.7	8.8	10	600	0.418	0.251	0.167
		E	85	125	2.7	8.8	10	100	1.118	0.671	0.447
	330	E	85	125	2.7	8.8	10	500	0.500	0.300	0.200
		D	85	125	2.7	13.2	14	400	0.512	0.307	0.205
		D	85	125	2.7	13.2	14	600	0.418	0.251	0.167
		E	85	125	2.7	13.2	12	200	0.791	0.474	0.316
		E	85	125	2.7	13.2	12	600	0.456	0.274	0.183
		V	85	125	2.7	13.2	12	200	0.866	0.520	0.346
	470	V	85	125	2.7	13.2	12	600	0.500	0.300	0.200
		D	85	125	2.7	18.8	14	200	0.725	0.435	0.290
		D	85	125	2.7	18.8	14	350	0.548	0.329	0.219
		E	85	125	2.7	18.8	12	150	0.913	0.548	0.365
		E	85	125	2.7	18.8	12	350	0.598	0.359	0.239
		V	85	125	2.7	18.8	12	150	1.000	0.600	0.400
	680	V	85	125	2.7	18.8	12	350	0.655	0.393	0.262
E		85	125	2.7	27.2	14	150	0.913	0.548	0.365	
1000	E	85	125	2.7	27.2	14	200	0.791	0.474	0.316	
	E	85	125	2.7	40.0	15	150	0.913	0.548	0.365	
6.3	33	E	85	125	2.7	40.0	15	200	0.791	0.474	0.316
		A	85	125	4	2.1	8	1500	0.208	0.125	0.083
	47	A	85	125	4	2.1	8	2000	0.180	0.108	0.072
		B	85	125	4	2.1	8	600	0.354	0.212	0.141
		B	85	125	4	3.0	8	600	0.354	0.212	0.141
		B	85	125	4	3.0	8	800	0.306	0.184	0.122
	68	C	85	125	4	3.0	6	300	0.548	0.329	0.219
		C	85	125	4	3.0	6	500	0.424	0.255	0.170
		B	85	125	4	4.3	10	500	0.387	0.232	0.155
		B	85	125	4	4.3	10	700	0.327	0.196	0.131
		C	85	125	4	4.3	8	500	0.424	0.255	0.170
		C	85	125	4	4.3	8	700	0.359	0.215	0.143
	100	D	85	125	4	4.3	6	250	0.648	0.389	0.259
		D	85	125	4	4.3	6	500	0.458	0.275	0.183
		B	85	125	4	6.3	14	400	0.433	0.260	0.173

1. Please do not use multimeter through the measuring procedures.
2. Capacitance and DF measured at :100Hz U_{DC} =2.2 1.0V U_{AC}~1.0 0.5V, Frequency=100Hz. Test only applied in series equivalent circuit.
3. Voltage derating is applied at +125 The DCL parameter should be read after 5 minutes when it connected to the circuit
4. Special size and demand could consult with us.

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Rated Voltage (V)	Rated CAP (μF)	Case Code	Rated Temp (°C)	Category Temp (°C)	Category Voltage (V)	Max DCL (μA) @25°C	Max DF(%) @25°C 100Hz	Max ESR (mΩ) @25°C 100KHz	Max Ripple @100kHz IRMS(A)		
									25°C	85°C	125°C
6.3	100	B	85	125	4	6.3	14	700	0.327	0.196	0.131
		C	85	125	4	6.3	8	300	0.548	0.329	0.219
		C	85	125	4	6.3	8	500	0.424	0.255	0.170
		D	85	125	4	6.3	8	300	0.592	0.355	0.237
	150	D	85	125	4	6.3	8	500	0.458	0.275	0.183
		C	85	125	4	9.5	12	300	0.548	0.329	0.219
		C	85	125	4	9.5	12	500	0.424	0.255	0.170
		D	85	125	4	9.5	10	300	0.592	0.355	0.237
	220	D	85	125	4	9.5	10	500	0.458	0.275	0.183
		E	85	125	4	9.5	10	150	0.913	0.548	0.365
		E	85	125	4	9.5	10	300	0.645	0.387	0.258
		C	85	125	4	13.9	14	200	0.671	0.402	0.268
	330	C	85	125	4	13.9	14	500	0.424	0.255	0.170
		D	85	125	4	13.9	12	150	0.837	0.502	0.335
		D	85	125	4	13.9	12	300	0.592	0.355	0.237
		E	85	125	4	13.9	12	150	0.913	0.548	0.365
	470	E	85	125	4	13.9	12	300	0.645	0.387	0.258
		D	85	125	4	20.8	14	150	0.837	0.502	0.335
		D	85	125	4	20.8	14	300	0.592	0.355	0.237
	680	E	85	125	4	20.8	14	150	0.913	0.548	0.365
E		85	125	4	20.8	14	300	0.645	0.387	0.258	
E		85	125	4	29.6	14	150	0.913	0.548	0.365	
10	15	E	85	125	4	29.6	14	300	0.645	0.387	0.258
		A	85	125	6.3	1.5	8	1000	0.255	0.153	0.102
		A	85	125	6.3	1.5	8	1800	0.190	0.114	0.076
		B	85	125	6.3	1.5	6	600	0.354	0.212	0.141
	22	B	85	125	6.3	1.5	6	900	0.289	0.173	0.115
		A	85	125	6.3	2.2	12	1200	0.233	0.140	0.093
		A	85	125	6.3	2.2	12	1500	0.208	0.125	0.083
		B	85	125	6.3	2.2	6	400	0.433	0.260	0.173
	33	B	85	125	6.3	2.2	6	500	0.387	0.232	0.155
		B	85	125	6.3	3.3	8	450	0.408	0.245	0.163
		B	85	125	6.3	3.3	8	700	0.327	0.196	0.131
		C	85	125	6.3	3.3	6	400	0.474	0.285	0.190
	47	C	85	125	6.3	3.3	6	600	0.387	0.232	0.155
		D	85	125	6.3	3.3	6	300	0.592	0.355	0.237
		D	85	125	6.3	3.3	6	500	0.458	0.275	0.183
		B	85	125	6.3	4.7	10	500	0.387	0.232	0.155
	68	B	85	125	6.3	4.7	10	700	0.327	0.196	0.131
		C	85	125	6.3	4.7	8	400	0.474	0.285	0.190
		C	85	125	6.3	4.7	8	600	0.387	0.232	0.155
		D	85	125	6.3	4.7	6	300	0.592	0.355	0.237
100	D	85	125	6.3	4.7	6	500	0.458	0.275	0.183	
	C	85	125	6.3	6.8	8	200	0.671	0.402	0.268	
	C	85	125	6.3	6.8	8	500	0.424	0.255	0.170	
	D	85	125	6.3	6.8	6	150	0.837	0.502	0.335	
100	D	85	125	6.3	6.8	6	400	0.512	0.307	0.205	
	C	85	125	6.3	10.0	10	250	0.600	0.360	0.240	
	C	85	125	6.3	10.0	10	500	0.424	0.255	0.170	
	D	85	125	6.3	10.0	8	200	0.725	0.435	0.290	
100	D	85	125	6.3	10.0	8	400	0.512	0.307	0.205	
	E	85	125	6.3	10.0	8	150	0.913	0.548	0.365	

1. Please do not use multimeter through the measuring procedures.
2. Capacitance and DF measured at :100Hz U_~ =2.2 1.0V U_~=1.0 0.5V, Frequency=100Hz. Test only applied in series equivalent circuit.
3. Voltage derating is applied at +125 The DCL parameter should be read after 5 minutes when it connected to the circuit
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Rated Voltage (V)	Rated CAP (µF)	Case Code	Rated Temp (°C)	Category Temp (°C)	Category Voltage (V)	Max DCL (µA) @25°C	Max DF(%) @25°C 100Hz	Max ESR (mΩ) @25°C 100KHz	Max Ripple @100kHz IRMS(A)		
									25°C	85°C	125°C
10	150	D	85	125	6.3	15.0	10	200	0.725	0.435	0.290
		D	85	125	6.3	15.0	10	400	0.512	0.307	0.205
		E	85	125	6.3	15.0	10	150	0.913	0.548	0.365
		E	85	125	6.3	15.0	10	300	0.645	0.387	0.258
	220	D	85	125	6.3	22.0	12	200	0.725	0.435	0.290
		D	85	125	6.3	22.0	12	400	0.512	0.307	0.205
		E	85	125	6.3	22.0	12	200	0.791	0.474	0.316
		E	85	125	6.3	22.0	12	400	0.559	0.335	0.224
	330	V	85	125	6.3	22.0	12	200	0.866	0.520	0.346
		V	85	125	6.3	22.0	12	400	0.612	0.367	0.245
		D	85	125	6.3	33.0	14	150	0.837	0.502	0.335
		D	85	125	6.3	33.0	14	250	0.648	0.389	0.259
	470	E	85	125	6.3	33.0	14	150	0.913	0.548	0.365
		E	85	125	6.3	33.0	14	200	0.791	0.474	0.316
		V	85	125	6.3	33.0	14	150	1.000	0.600	0.400
		V	85	125	6.3	33.0	14	200	0.866	0.520	0.346
680	E	85	125	6.3	47.0	14	200	0.791	0.474	0.316	
	E	85	125	6.3	68.0	14	150	0.913	0.548	0.365	
680	E	85	125	6.3	68.0	14	200	0.791	0.474	0.316	
	E	85	125	6.3	68.0	14	200	0.791	0.474	0.316	
16	6.8	A	85	125	10	1.1	6	2000	0.180	0.108	0.072
		A	85	125	10	1.1	6	2500	0.161	0.097	0.064
		B	85	125	10	1.1	6	1200	0.250	0.150	0.100
	10	B	85	125	10	1.1	6	2000	0.194	0.116	0.077
		A	85	125	10	1.6	8	1700	0.196	0.117	0.078
		B	85	125	10	1.6	6	1200	0.250	0.150	0.100
	15	B	85	125	10	1.6	6	2000	0.194	0.116	0.077
		B	85	125	10	2.4	6	800	0.306	0.184	0.122
		B	85	125	10	2.4	6	1000	0.274	0.164	0.110
	22	C	85	125	10	2.4	6	600	0.387	0.232	0.155
		B	85	125	10	3.5	8	700	0.327	0.196	0.131
		B	85	125	10	3.5	8	1000	0.274	0.164	0.110
		C	85	125	10	3.5	6	500	0.424	0.255	0.170
	33	C	85	125	10	3.5	6	700	0.359	0.215	0.143
		D	85	125	10	3.5	6	500	0.458	0.275	0.183
		C	85	125	10	5.3	6	500	0.424	0.255	0.170
		C	85	125	10	5.3	6	700	0.359	0.215	0.143
	47	D	85	125	10	5.3	6	300	0.592	0.355	0.237
		D	85	125	10	5.3	6	500	0.458	0.275	0.183
		C	85	125	10	7.5	8	300	0.548	0.329	0.219
		C	85	125	10	7.5	8	500	0.424	0.255	0.170
	68	D	85	125	10	7.5	6	300	0.592	0.355	0.237
		D	85	125	10	7.5	6	500	0.458	0.275	0.183
		E	85	125	10	7.5	6	200	0.791	0.474	0.316
		E	85	125	10	7.5	6	600	0.456	0.274	0.183
	100	C	85	125	10	10.9	8	1000	0.300	0.180	0.120
		D	85	125	10	10.9	8	200	0.725	0.435	0.290
		D	85	125	10	10.9	8	450	0.483	0.290	0.193
		E	85	125	10	10.9	6	200	0.791	0.474	0.316
	100	E	85	125	10	10.9	6	600	0.456	0.274	0.183
		C	85	125	10	16.0	12	800	0.335	0.201	0.134
		D	85	125	10	16.0	8	200	0.725	0.435	0.290
		D	85	125	10	16.0	8	500	0.458	0.275	0.183
	100	E	85	125	10	16.0	8	200	0.791	0.474	0.316
		E	85	125	10	16.0	8	200	0.791	0.474	0.316

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Low ESR – SMD

Rated Voltage (V)	Rated CAP (µF)	Case Code	Rated Temp (°C)	Category Temp (°C)	Category Voltage (V)	Max DCL (µA) @25°C	Max DF(%) @25°C 100Hz	Max ESR (mΩ) @25°C 100KHz	Max Ripple @100kHz IRMS(A)		
									25°C	85°C	125°C
16	100	E	85	125	10	16.0	8	600	0.456	0.274	0.183
		D	85	125	10	24.0	12	500	0.458	0.275	0.183
	150	D	85	125	10	24.0	12	600	0.418	0.251	0.167
		E	85	125	10	24.0	10	200	0.791	0.474	0.316
		E	85	125	10	24.0	10	250	0.707	0.424	0.283
		E	85	125	10	35.2	12	200	0.791	0.474	0.316
	220	E	85	125	10	35.2	12	400	0.559	0.335	0.224
		V	85	125	10	35.2	12	200	0.866	0.520	0.346
		V	85	125	10	35.2	12	400	0.612	0.367	0.245
		E	85	125	10	52.8	12	180	0.833	0.500	0.333
	330	E	85	125	10	52.8	12	500	0.500	0.300	0.200
		V	85	125	10	52.8	12	180	0.913	0.548	0.365
		V	85	125	10	52.8	12	500	0.548	0.329	0.219
		E	85	125	10	75.2	16	450	0.527	0.316	0.211
	470	E	85	125	10	75.2	16	600	0.456	0.274	0.183
		E	85	125	15	0.7	6	4000	0.127	0.076	0.051
20	3.3	A	85	125	15	0.7	6	5000	0.114	0.068	0.046
		B	85	125	15	0.7	6	3000	0.158	0.095	0.063
		B	85	125	15	0.7	6	4000	0.137	0.082	0.055
		A	85	125	15	0.9	6	2500	0.161	0.097	0.064
	4.7	A	85	125	15	0.9	6	5000	0.114	0.068	0.046
		B	85	125	15	0.9	6	1500	0.224	0.134	0.089
		B	85	125	15	0.9	6	3000	0.158	0.095	0.063
		C	85	125	15	0.9	6	1000	0.300	0.180	0.120
		C	85	125	15	0.9	6	2500	0.190	0.114	0.076
		B	85	125	15	1.4	6	1000	0.274	0.164	0.110
	6.8	B	85	125	15	1.4	6	1800	0.204	0.122	0.082
		C	85	125	15	1.4	6	800	0.335	0.201	0.134
		C	85	125	15	1.4	6	1200	0.274	0.164	0.110
		B	85	125	15	2.0	6	1200	0.250	0.150	0.100
	10	B	85	125	15	2.0	6	1800	0.204	0.122	0.082
		C	85	125	15	2.0	6	600	0.387	0.232	0.155
		C	85	125	15	2.0	6	1000	0.300	0.180	0.120
		D	85	125	15	2.0	6	500	0.458	0.275	0.183
		D	85	125	15	2.0	6	1000	0.324	0.194	0.130
		B	85	125	15	3.0	6	1500	0.224	0.134	0.089
	15	B	85	125	15	3.0	6	1800	0.204	0.122	0.082
		C	85	125	15	3.0	6	800	0.335	0.201	0.134
		C	85	125	15	3.0	6	1000	0.300	0.180	0.120
		D	85	125	15	3.0	6	600	0.418	0.251	0.167
		D	85	125	15	3.0	6	800	0.362	0.217	0.145
		C	85	125	15	4.4	6	600	0.387	0.232	0.155
	22	C	85	125	15	4.4	6	900	0.316	0.190	0.126
		D	85	125	15	4.4	6	400	0.512	0.307	0.205
		D	85	125	15	4.4	6	600	0.418	0.251	0.167
		C	85	125	15	6.6	6	600	0.387	0.232	0.155
	33	C	85	125	15	6.6	6	900	0.316	0.190	0.126
		D	85	125	15	6.6	6	400	0.512	0.307	0.205
		D	85	125	15	6.6	6	600	0.418	0.251	0.167
	47	C	85	125	15	9.4	8	300	0.548	0.329	0.219
		C	85	125	15	9.4	8	400	0.474	0.285	0.190
		D	85	125	15	9.4	8	250	0.648	0.389	0.259
		D	85	125	15	9.4	8	500	0.458	0.275	0.183
		E	85	125	15	9.4	6	250	0.707	0.424	0.283

1. Please do not use multimeter through the measuring procedures.
2. Capacitance and DF measured at :100Hz U_~ =2.2 1.0V U_~=1.0 0.5V, Frequency=100Hz. Test only applied in series equivalent circuit.
3. Voltage derating is applied at +125 The DCL parameter should be read after 5 minutes when it connected to the circuit
4. Special size and demand could consult with us.

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Chip Tantalum Capacitor

Low ESR – SMD

Rated Voltage (V)	Rated CAP (µF)	Case Code	Rated Temp (°C)	Category Temp (°C)	Category Voltage (V)	Max DCL (µA) @25°C	Max DF(%) @25°C 100Hz	Max ESR (mΩ) @25°C 100KHz	Max Ripple @100kHz IRMS(A)		
									25°C	85°C	125°C
20	47	E	85	125	15	9.4	6	500	0.500	0.300	0.200
		D	85	125	15	13.6	8	250	0.648	0.389	0.259
	68	D	85	125	15	13.6	8	300	0.592	0.355	0.237
		E	85	125	15	13.6	6	250	0.707	0.424	0.283
		E	85	125	15	13.6	6	500	0.500	0.300	0.200
		D	85	125	15	20.0	10	300	0.592	0.355	0.237
	100	D	85	125	15	20.0	10	400	0.512	0.307	0.205
		E	85	125	15	20.0	10	250	0.707	0.424	0.283
		E	85	125	15	20.0	10	300	0.645	0.387	0.258
	150	D	85	125	15	30.0	10	450	0.483	0.290	0.193
		D	85	125	15	30.0	10	600	0.418	0.251	0.167
		E	85	125	15	30.0	10	180	0.833	0.500	0.333
	220	E	85	125	15	30.0	10	250	0.707	0.424	0.283
		E	85	125	15	44.0	12	450	0.527	0.316	0.211
		E	85	125	15	44.0	12	600	0.456	0.274	0.183
	330	V	85	125	15	44.0	12	250	0.775	0.465	0.310
		V	85	125	15	44.0	12	400	0.612	0.367	0.245
		E	85	125	15	66.0	12	450	0.527	0.316	0.211
25	1.5	E	85	125	15	66.0	12	600	0.456	0.274	0.183
		V	85	125	15	66.0	12	450	0.577	0.346	0.231
		V	85	125	15	66.0	12	600	0.500	0.300	0.200
	2.2	A	85	125	17	0.5	6	4500	0.120	0.072	0.048
		A	85	125	17	0.5	6	7500	0.093	0.056	0.037
		B	85	125	17	0.5	6	3000	0.158	0.095	0.063
	3.3	B	85	125	17	0.5	6	5000	0.122	0.073	0.049
		A	85	125	17	0.6	6	3000	0.147	0.088	0.059
		A	85	125	17	0.6	6	8000	0.090	0.054	0.036
	4.7	B	85	125	17	0.6	6	2500	0.173	0.104	0.069
		B	85	125	17	0.6	6	5000	0.122	0.073	0.049
		B	85	125	17	0.6	6	3000	0.194	0.116	0.077
	6.8	B	85	125	17	0.8	6	2000	0.194	0.116	0.077
		B	85	125	17	0.8	6	3000	0.158	0.095	0.063
		C	85	125	17	0.8	6	1200	0.274	0.164	0.110
	10	C	85	125	17	0.8	6	2000	0.212	0.127	0.085
		B	85	125	17	1.2	6	1000	0.274	0.164	0.110
		B	85	125	17	1.2	6	1200	0.250	0.150	0.100
15	C	85	125	17	1.2	6	1000	0.300	0.180	0.120	
	C	85	125	17	1.2	6	2000	0.212	0.127	0.085	
	B	85	125	17	1.7	6	2000	0.194	0.116	0.077	
22	B	85	125	17	1.7	6	2500	0.173	0.104	0.069	
	C	85	125	17	1.7	6	1000	0.300	0.180	0.120	
	C	85	125	17	1.7	6	1500	0.245	0.147	0.098	
25	6.8	D	85	125	17	1.7	6	700	0.387	0.232	0.155
		D	85	125	17	1.7	6	1000	0.324	0.194	0.130
		B	85	125	17	2.5	8	1500	0.224	0.134	0.089
	10	B	85	125	17	2.5	8	2000	0.194	0.116	0.077
		C	85	125	17	2.5	6	900	0.316	0.190	0.126
		C	85	125	17	2.5	6	1200	0.274	0.164	0.110
	15	D	85	125	17	2.5	6	450	0.483	0.290	0.193
		D	85	125	17	2.5	6	800	0.362	0.217	0.145
		C	85	125	17	3.8	6	500	0.424	0.255	0.170
	22	C	85	125	17	3.8	6	1000	0.300	0.180	0.120
		D	85	125	17	3.8	6	400	0.512	0.307	0.205
		D	85	125	17	3.8	6	600	0.418	0.251	0.167
25	22	C	85	125	17	5.5	6	800	0.335	0.201	0.134

1. Please do not use multimeter through the measuring procedures.
2. Capacitance and DF measured at :100Hz U_{DC} =2.2 1.0V U_{AC}~1.0 0.5V, Frequency=100Hz. Test only applied in series equivalent circuit.
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Low ESR – SMD

Rated Voltage (V)	Rated CAP (µF)	Case Code	Rated Temp (°C)	Category Temp (°C)	Category Voltage (V)	Max DCL (µA) @25°C	Max DF(%) @25°C 100Hz	Max ESR (mΩ) @25°C 100KHz	Max Ripple @100kHz IRMS(A)		
									25°C	85°C	125°C
25	22	C	85	125	17	5.5	6	1000	0.300	0.180	0.120
		D	85	125	17	5.5	6	400	0.512	0.307	0.205
		D	85	125	17	5.5	6	600	0.418	0.251	0.167
	33	D	85	125	17	8.3	8	300	0.592	0.355	0.237
		D	85	125	17	8.3	8	500	0.458	0.275	0.183
		E	85	125	17	8.3	6	250	0.707	0.424	0.283
	47	D	85	125	17	11.8	8	350	0.548	0.329	0.219
		D	85	125	17	11.8	8	500	0.458	0.275	0.183
		E	85	125	17	11.8	6	300	0.645	0.387	0.258
	68	E	85	125	17	17.0	8	250	0.707	0.424	0.283
		E	85	125	17	17.0	8	500	0.500	0.300	0.200
		V	85	125	17	17.0	8	250	0.775	0.465	0.310
	100	V	85	125	17	17.0	8	600	0.500	0.300	0.200
		E	85	125	17	25.0	10	200	0.791	0.474	0.316
		E	85	125	17	25.0	10	250	0.707	0.424	0.283
	150	V	85	125	17	25.0	10	200	0.866	0.520	0.346
		V	85	125	17	25.0	10	250	0.775	0.465	0.310
		E	85	125	17	37.5	10	600	0.456	0.274	0.183
35	0.47	A	85	125	23	0.5	6	4000	0.127	0.076	0.051
		A	85	125	23	0.5	6	8000	0.090	0.054	0.036
	0.68	A	85	125	23	0.5	6	6000	0.104	0.062	0.042
		A	85	125	23	0.5	6	7000	0.096	0.058	0.039
	1	A	85	125	23	0.5	6	6000	0.104	0.062	0.042
		A	85	125	23	0.5	6	7000	0.096	0.058	0.039
		B	85	125	23	0.5	4	2500	0.173	0.104	0.069
	1.5	B	85	125	23	0.5	4	3000	0.158	0.095	0.063
		B	85	125	23	0.5	6	4000	0.137	0.082	0.055
		C	85	125	23	0.5	6	2500	0.190	0.114	0.076
	2.2	C	85	125	23	0.5	6	3000	0.173	0.104	0.069
		B	85	125	23	0.8	6	2500	0.173	0.104	0.069
		B	85	125	23	0.8	6	3000	0.158	0.095	0.063
	3.3	C	85	125	23	0.8	6	2000	0.212	0.127	0.085
		C	85	125	23	0.8	6	2500	0.190	0.114	0.076
		B	85	125	23	1.2	6	2500	0.173	0.104	0.069
	4.7	B	85	125	23	1.2	6	3000	0.158	0.095	0.063
		C	85	125	23	1.2	6	1200	0.274	0.164	0.110
		C	85	125	23	1.2	6	2000	0.212	0.127	0.085
	6.8	B	85	125	23	1.6	8	2000	0.194	0.116	0.077
		B	85	125	23	1.6	8	2500	0.173	0.104	0.069
		C	85	125	23	1.6	6	800	0.335	0.201	0.134
	10	C	85	125	23	1.6	6	1000	0.300	0.180	0.120
		D	85	125	23	1.6	6	700	0.387	0.232	0.155
		D	85	125	23	1.6	6	1000	0.324	0.194	0.130
	10	C	85	125	23	2.4	6	700	0.359	0.215	0.143
		C	85	125	23	2.4	6	1200	0.274	0.164	0.110
		D	85	125	23	2.4	6	600	0.418	0.251	0.167
	10	D	85	125	23	2.4	6	1000	0.324	0.194	0.130
		C	85	125	23	3.5	6	700	0.359	0.215	0.143
		C	85	125	23	3.5	6	1000	0.300	0.180	0.120
	10	D	85	125	23	3.5	6	400	0.512	0.307	0.205

1. Please do not use multimeter through the measuring procedures.
2. Capacitance and DF measured at :100Hz U_~ =2.2 1.0V U_~=1.0 0.5V, Frequency=100Hz. Test only applied in series equivalent circuit.
3. Voltage derating is applied at +125 The DCL parameter should be read after 5 minutes when it connected to the circuit
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Low ESR – SMD

Rated Voltage (V)	Rated CAP (μF)	Case Code	Rated Temp (°C)	Category Temp (°C)	Category Voltage (V)	Max DCL (μA) @25°C	Max DF(%) @25°C 100Hz	Max ESR (mΩ) @25°C 100KHz	Max Ripple @100kHz IRMS(A)		
									25°C	85°C	125°C
35	10	D	85	125	23	3.5	6	800	0.362	0.217	0.145
		D	85	125	23	5.3	6	350	0.548	0.329	0.219
	15	D	85	125	23	5.3	6	600	0.418	0.251	0.167
		E	85	125	23	5.3	6	300	0.645	0.387	0.258
		E	85	125	23	5.3	6	600	0.456	0.274	0.183
		D	85	125	23	7.7	6	400	0.512	0.307	0.205
	22	D	85	125	23	7.7	6	500	0.458	0.275	0.183
		E	85	125	23	7.7	6	300	0.645	0.387	0.258
		E	85	125	23	7.7	6	400	0.559	0.335	0.224
	33	D	85	125	23	11.6	8	500	0.458	0.275	0.183
		D	85	125	23	11.6	8	700	0.387	0.232	0.155
		E	85	125	23	11.6	6	300	0.645	0.387	0.258
	47	E	85	125	23	11.6	6	600	0.456	0.274	0.183
		D	85	125	23	16.5	8	400	0.512	0.307	0.205
		D	85	125	23	16.5	8	900	0.342	0.205	0.137
	68	E	85	125	23	16.5	6	400	0.559	0.335	0.224
		E	85	125	23	16.5	6	600	0.456	0.274	0.183
		E	85	125	23	23.8	8	800	0.395	0.237	0.158
50	0.47	A	85	125	33	0.5	6	3000	0.147	0.088	0.059
		A	85	125	33	0.5	6	6000	0.104	0.062	0.042
	0.68	B	85	125	33	0.5	6	3000	0.158	0.095	0.063
		B	85	125	33	0.5	6	6000	0.112	0.067	0.045
	1	B	85	125	33	0.5	6	2500	0.173	0.104	0.069
		C	85	125	33	0.5	6	4000	0.137	0.082	0.055
		C	85	125	33	0.5	4	1800	0.224	0.134	0.089
	1.5	C	85	125	33	0.5	4	4000	0.150	0.090	0.060
		C	85	125	33	0.8	6	1800	0.224	0.134	0.089
		C	85	125	33	0.8	6	3000	0.173	0.104	0.069
	2.2	D	85	125	33	0.8	6	1000	0.324	0.194	0.130
		D	85	125	33	0.8	6	2500	0.205	0.123	0.082
		C	85	125	33	1.1	6	1500	0.245	0.147	0.098
	3.3	C	85	125	33	1.1	6	2000	0.212	0.127	0.085
		D	85	125	33	1.1	6	700	0.387	0.232	0.155
		D	85	125	33	1.1	6	1000	0.324	0.194	0.130
	4.7	C	85	125	33	1.7	6	700	0.359	0.215	0.143
		C	85	125	33	1.7	6	1500	0.245	0.147	0.098
		D	85	125	33	1.7	6	700	0.387	0.232	0.155
	6.8	D	85	125	33	1.7	6	1500	0.265	0.159	0.106
		C	85	125	33	2.4	6	700	0.359	0.215	0.143
		C	85	125	33	2.4	6	1000	0.300	0.180	0.120
	10	D	85	125	33	2.4	6	600	0.418	0.251	0.167
		D	85	125	33	2.4	6	1000	0.324	0.194	0.130
		D	85	125	33	3.4	6	600	0.418	0.251	0.167
	15	D	85	125	33	3.4	6	800	0.362	0.217	0.145
		E	85	125	33	3.4	6	500	0.500	0.300	0.200
		E	85	125	33	3.4	6	1000	0.354	0.212	0.141
	22	D	85	125	33	5.0	6	400	0.512	0.307	0.205
		D	85	125	33	5.0	6	600	0.418	0.251	0.167
E		85	125	33	5.0	6	400	0.559	0.335	0.224	
33	E	85	125	33	5.0	6	800	0.395	0.237	0.158	
	E	85	125	33	7.5	6	400	0.559	0.335	0.224	
	E	85	125	33	7.5	6	500	0.500	0.300	0.200	
47	E	85	125	33	11.0	8	400	0.559	0.335	0.224	
	E	85	125	33	11.0	8	500	0.500	0.300	0.200	

1. Please do not use multimeter through the measuring procedures.
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Low ESR – SMD

Rated Voltage (V)	Rated CAP (µF)	Case Code	Rated Temp (°C)	Category Temp (°C)	Category Voltage (V)	Max DCL (µA) @25°C	Max DF(%) @25°C 100Hz	Max ESR (mΩ) @25°C 100KHz	Max Ripple @100kHz IRMS(A)		
									25°C	85°C	125°C
63	1	C	85	125	40	0.6	6	2000	0.212	0.127	0.085
	1.5	D	85	125	40	0.9	6	2500	0.205	0.123	0.082
	2.2	D	85	125	40	1.4	6	1500	0.265	0.159	0.106
	3.3	D	85	125	40	2.1	6	1200	0.296	0.177	0.118
	4.7	E	85	125	40	3.0	6	800	0.395	0.237	0.158
	6.8	E	85	125	40	4.3	6	600	0.456	0.274	0.183
	10	E	85	125	40	6.3	8	450	0.527	0.316	0.211
	15	E	85	125	40	9.5	8	300	0.645	0.387	0.258
22	V	85	125	40	9.5	8	300	0.707	0.424	0.283	
	V	85	125	40	13.9	8	300	0.707	0.424	0.283	

- Please do not use multimeter through the measuring procedures.
- Capacitance and DF measured at :100Hz U_{DC} =2.2 1.0V U_{AC}~1.0 0.5V, Frequency=100Hz. Test only applied in series equivalent circuit.
- Voltage derating is applied at +125 The DCL parameter should be read after 5 minutes when it connected to the circuit
- Special size and demand could consult with us.

Land Dimension / Courtyard

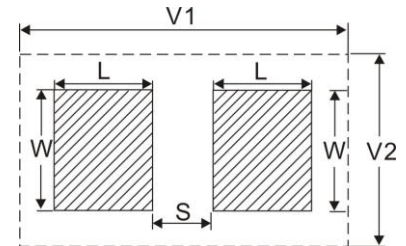
Case Code	Density Level A: Maximum (Most) Land Protrusion (mm)					Density Level B : Median (Nominal) Land Protrusion (mm)					Density Level C: Minimum (Least) Land Protrusion (mm)				
	W	L	S	V1	V2	W	L	S	V1	V2	W	L	S	V1	V2
A	1.35	2.20	0.62	6.02	2.8	1.23	1.8	0.82	4.92	2.3	1.13	1.42	0.98	4.06	2.04
B	2.35	2.21	0.92	6.32	4.0	2.23	1.8	1.12	5.22	3.5	2.13	1.42	1.28	4.36	3.24
C	2.35	2.77	2.37	8.92	4.5	2.23	2.37	2.57	7.82	4	2.13	1.99	2.73	6.96	3.74
D	2.55	2.77	3.67	10.22	5.6	2.43	2.37	3.87	9.12	5.1	2.33	1.99	4.03	8.26	4.84
E	2.55	2.77	3.67	10.22	5.6	2.43	2.37	3.87	9.12	5.1	2.33	1.99	4.03	8.26	4.84

Density Level A: For low-density product applications. Recommended for wave solder applications and provides a wider process window for reflow solder processes.

Density Level B: For products with a moderate level of component density. Provides a robust solder attachment condition for reflow solder processes.

Density Level C: For high component density product applications. Before adapting the minimum land pattern variations the user should perform qualification testing based on the conditions outlined in IPC standard 7351 (IPC-7351).

- Height of these chips may create problems in wave soldering.
- Land pattern geometry is too small for silkscreen outline.



Surface Mount Footprints

Soldering Process

Kingtronics tantalum capacitors are compatible with wave (single or dual), convection, IR, or vapor phase reflow techniques. Preheating of these components is recommended to avoid extreme thermal stress. Kingtronics's recommended profile conditions for convection and IR reflow reflect the profile conditions of the IPC/J STD 020D standard for moisture sensitivity testing. The devices can safely withstand a maximum of three reflow passes at these conditions.

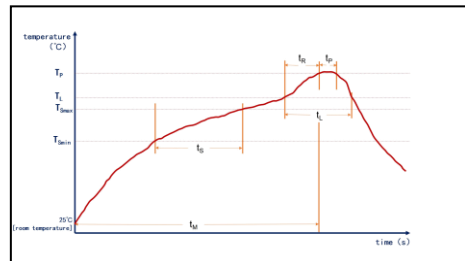
Hand soldering should be performed with care due to the difficulty in process control. If performed, care should be taken to avoid contact of the soldering iron to the molded case. The iron should be used to heat the solder pad, applying solder between the pad and the termination, until reflow occurs. Once reflow occurs, the iron should be removed immediately. "Wiping" the edges of a chip and heating the top surface is not recommended.

During typical reflow operations, a slight darkening of the gold-colored epoxy may be observed. This slight darkening is normal and not harmful to the product. Marking permanency is not affected by this change.

Curve Characteristics	Tin Lead Solder	Leda-free Solder
Preheating Minimum Temperature (T _{Smin})	100 °C	150 °C
Preheat Maximum Temperature (T _{Smax})	150 °C	200 °C
Warming-up Time (ts)	60 – 120 seconds	60 – 120 seconds
Heating Rate (T _L to T _P)	≤3 °C /seconds	≤3 °C /seconds
Melting Point of Solder Paste (T _L)	183 °C	217 °C
Melting Time of Solder Paste (t _L)	60 – 150 seconds	60 – 150 seconds
Peak Temperature (T _P)	220 °C* or 235 °C**	245 °C* or 250 °C**
Peak Temperature Holding Time, Deviation Less than 5 °C (t _P)	≤10 seconds	≤5 seconds
Cooling Rate (T _P to T _L)	≤6 °C /seconds	≤6 °C /seconds
Room Temperature 25 °C to Peak Temperature Time	≤6 minutes	≤8 minutes

Note: All temperatures refer to the center of the package, measured on the package body surface that is facing up during assembly reflow.

*Case Size D, E**Case Size A, B, C



Recommended Reflow Profile

Kingtronics® International Company

Kingtronics®

EKT

Chip Tantalum Capacitor

Low ESR – SMD

How to order

<u>EKT</u>	<u>0R1</u>	<u>M</u>	<u>350</u>	<u>A</u>	<u>T</u>	<u>R</u>
Series	<u>1.</u>	<u>2.</u>	<u>3.</u>	<u>4.</u>	<u>5.</u>	<u>6.</u>

1. Nominal Capacitance

Code	0R1	R22	010	2R2	220	221
Capacitance	0.1uF	0.22uF	1uF	2.2uF	22uF	220uF

2. Capacitance Tolerance

Code	K	M
Tolerance	±10%	±20%

3. Rated Voltage

Code	040	060	100	160	200	250	350	500
Voltage	4V	6.3V	10V	16V	20V	25V	35V	50V

4. Case

Code	A	B	C	D
Case	A	B	C	D

5. Packing

Code	T
Packing	Tape & Reel

6. Pb

Code	L	R
Pb	Lead	RoHS

Note: Specifications are subject to change without notice.

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