

SMD Chip Tantalum Capacitor Low ESR – JTC



FEATURES

- Low ESR, Volumetrically efficient, Stable in electrical & storage performances
- Long lifespan, High reliability.
- 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.

SPECIFICATIONS

Temperature Range -55°C to +125°C

Capacitance Range 0.47µF – 1000µF

Capacitance Tolerance ±20%, ±10%

Technical Data All technical data relate to an ambient temperature of +25°C

Termination Finished Sn Plating (standard), Gold and SnPb Plating upon request

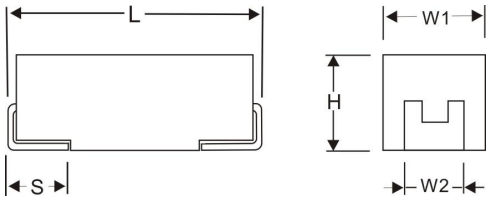
Rated Voltage (V_R) ≤ +85°C:

Category Voltage (V_C) ≤ +125°C:

Surge Voltage (V_S) ≤ +85°C:

Surge Voltage (V_S) ≤ +125°C:

4	6.3	10	16	20	25	35	50	63
2.7	4	6.3	10	15	17	23	33	40
5.2	8	13	20	26	32	46	65	82
3.4	5	8	13	16	20	28	40	50



DIMENSIONS – MILLIMETERS (Unit: mm)

case	EIA Code	L	W ₁	H	W ₂	S
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

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				B(800,1000),C(600)
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(450,800),C(500,1000)	B(500,700),C(500,700),D(250,500)	C(200,500),D(150,400)	C(1000),D(200,450),E(200,600)
150	C(500,900),D(350,700),E(200,600)	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(300,600),E(100,500)	C(300,500),D(300,500),E(150,300)	D(200,400),E(150,300)	D(500,600),E(200,250)
330	D(400,600),E(200,600),V(200,600)	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(200,350),E(150,350),V(150,350)	D(150,300),E(150,300)	D(150,250),E(150,200),V(150,200)	E(180,500),V(180,500)
680	E(150,200)	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)	A(3000,6000)	
0.68			A(6000,A(7000)	B(3000,6000)	
1			A(6000,7000),B(2500,3000)	B(2500,4000),C(1800,4000)	C(2000)
1.5		A(4500,7500),B(3000,5000)	B(3000,4000),C(2500,3000)	C(1800,3000),D(1000,2500)	D(2500)
2.2		A(3000,8000),B(2500,5000)	B(2500,3000),C(2000,2500)	C(1500,2000),D(700,1000)	D(1500)
3.3	A(4000,5000),B(3000,4000)	B(2000,3000),C(1200,2000)	B(2500,3000),C(1200,2000)	C(700,1500),D(700,1500)	D(1200)
4.7	A(2500,5000),B(1500,3000),C(1000,2500)	B(1000,1200),C(1000,2000)	B(2000,2500),C(800,1000),D(700,1000)	C(700,1000),D(600,1000)	E(800)
6.8	B(1000,1800),C(800,1200)	B(2000,2500),C(1000,1500),D(700,1000)	C(700,1200),D(600,1000)	D(600,800),E(500,1000)	E(600)
10	B(1200,1800),C(600,1000),D(500,1000)	B(1500,2000),C(900,1200),D(450,800)	C(700,1000),D(400,800)	D(400,600),E(400,800)	E(450)
15	B(1500,1800),C(800,1000),D(600,800)	C(500,1000),D(400,600)	D(350,600),E(300,600)	E(400,500)	E(300)V(300)
22	C(600,900),D(400,600)	C(800,1000),D(400,600)	D(400,500),E(300,400)	E(400,500)	V(300)
33	C(600,900),D(400,600)	D(300,500),E(250,500)	D(500,700),E(300,600)		
47	C(300,400),D(250,500),E(250,500)	D(350,500),E(300,600)	D(400,900),E(400,600)		
68	D(250,300),E(250,500)	E(250,500),V(250,600)	E(800)		
100	D(300,400),E(250,300)	E(200,250),V(200,250)			
150	D(450,600),E(180,250)	E(600),V(300)			
220	E(450,600),V(250,400)				
330	E(450,600),V(450,600)				

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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
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
		E	85	125	2.7	27.2	14	200	0.791	0.474	0.316
	1000	E	85	125	2.7	40.0	15	150	0.913	0.548	0.365
		E	85	125	2.7	40.0	15	200	0.791	0.474	0.316
6.3	33	A	85	125	4	2.1	8	1500	0.208	0.125	0.083
		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
	47	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
		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
	68	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
		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
	100	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₊ = 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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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 I RMS(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
		D	85	125	4	6.3	8	500	0.458	0.275	0.183
	150	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
		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
	220	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
		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
	330	E	85	125	4	13.9	12	150	0.913	0.548	0.365
		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
	470	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	
680	E	85	125	4	29.6	14	300	0.645	0.387	0.258	
	E	85	125	4	42.8	14	150	0.913	0.548	0.365	
E	E	85	125	4	42.8	14	300	0.645	0.387	0.258	
	10	15	A	85	125	6.3	1.5	8	1000	0.255	0.153
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
B			85	125	6.3	1.5	6	900	0.289	0.173	0.115
22		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
		B	85	125	6.3	2.2	6	500	0.387	0.232	0.155
33		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
		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
47		B	85	125	6.3	4.7	10	500	0.387	0.232	0.155
		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
		D	85	125	6.3	4.7	6	500	0.458	0.275	0.183
68	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	
	D	85	125	6.3	6.8	6	400	0.512	0.307	0.205	
100	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	
	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		

- 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.

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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	150	0.913	0.548	0.365	
	E	85	125	6.3	47.0	14	200	0.791	0.474	0.316	
680	E	85	125	6.3	68.0	14	150	0.913	0.548	0.365	
	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
		B	85	125	10	1.1	6	2000	0.194	0.116	0.077
	10	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
		B	85	125	10	1.6	6	2000	0.194	0.116	0.077
	15	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
		C	85	125	10	2.4	6	600	0.387	0.232	0.155
	22	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
		C	85	125	10	3.5	6	700	0.359	0.215	0.143
	33	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
		D	85	125	10	5.3	6	300	0.592	0.355	0.237
	47	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
		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
	68	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
		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
	100	E	85	125	10	10.9	6	200	0.791	0.474	0.316
		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

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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SMD Chip Tantalum Capacitor Low ESR – JTC

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
	150	D	85	125	10	24.0	12	500	0.458	0.275	0.183
		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
	220	E	85	125	10	35.2	12	200	0.791	0.474	0.316
		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
	330	E	85	125	10	52.8	12	180	0.833	0.500	0.333
		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
	470	E	85	125	10	75.2	16	450	0.527	0.316	0.211
		E	85	125	10	75.2	16	600	0.456	0.274	0.183
	20	3.3	A	85	125	15	0.7	6	4000	0.127	0.076
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
4.7		A	85	125	15	0.9	6	2500	0.161	0.097	0.064
		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
6.8		B	85	125	15	1.4	6	1000	0.274	0.164	0.110
		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
10		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
		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
15		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
		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
22		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
		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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SMD Chip Tantalum Capacitor Low ESR – JTC

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
	68	D	85	125	15	13.6	8	250	0.648	0.389	0.259
		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
	100	D	85	125	15	20.0	10	300	0.592	0.355	0.237
		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
		E	85	125	15	30.0	10	250	0.707	0.424	0.283
	220	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
		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
	330	E	85	125	15	66.0	12	450	0.527	0.316	0.211
		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	
25	1.5	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
		B	85	125	17	0.5	6	5000	0.122	0.073	0.049
	2.2	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
		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
	3.3	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
		C	85	125	17	0.8	6	2000	0.212	0.127	0.085
	4.7	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
		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
	6.8	B	85	125	17	1.7	6	2000	0.194	0.116	0.077
		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
		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
	10	B	85	125	17	2.5	8	1500	0.224	0.134	0.089
		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
		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
15	C	85	125	17	3.8	6	500	0.424	0.255	0.170	
	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	
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₊ =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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SMD Chip Tantalum Capacitor Low ESR – JTC

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
		E	85	125	17	8.3	6	500	0.500	0.300	0.200
	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	11.8	6	600	0.456	0.274	0.183
		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	3000	0.158	0.095	0.063
		C	85	125	23	0.5	6	4000	0.137	0.082	0.055
	2.2	C	85	125	23	0.5	6	2500	0.190	0.114	0.076
		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
	3.3	B	85	125	23	0.8	6	3000	0.158	0.095	0.063
		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
	4.7	B	85	125	23	1.2	6	2500	0.173	0.104	0.069
		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
		D	85	125	23	1.6	8	2000	0.194	0.116	0.077
	6.8	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
		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
	10	D	85	125	23	1.6	6	1000	0.324	0.194	0.130
		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

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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SMD Chip Tantalum Capacitor Low ESR – JTC

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
	15	D	85	125	23	5.3	6	350	0.548	0.329	0.219
		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
	22	D	85	125	23	7.7	6	400	0.512	0.307	0.205
		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
		E	85	125	23	11.6	6	600	0.456	0.274	0.183
	47	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
		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	
68	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
		B	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
		C	85	125	33	0.5	4	4000	0.150	0.090	0.060
	1.5	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
		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
	2.2	C	85	125	33	1.1	6	1500	0.245	0.147	0.098
		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
	3.3	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
		D	85	125	33	1.7	6	1500	0.265	0.159	0.106
	4.7	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
		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
	6.8	D	85	125	33	3.4	6	600	0.418	0.251	0.167
		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
10	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	
	E	85	125	33	5.0	6	800	0.395	0.237	0.158	
15	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	
22	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.
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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SMD Chip Tantalum Capacitor Low ESR – JTC

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	V	85	125	40	9.5	8	300	0.645	0.387	0.258
22	V	85	125	40	13.9	8	300	0.707	0.424	0.283	

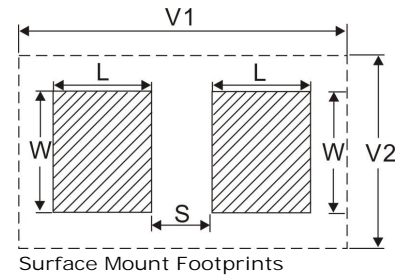
1. Please do not use multimeter through the measuring procedures.
2. Capacitance and DF measured at : 100Hz U_{DC} = 2.2 1.0V U_{AC} = 1.0 0.5V, Frequency=100Hz. Test only applied in series equivalent circuit.
3. Voltage derating is applied at +125 The DCL parameter should be read after 5 minutes when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

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).

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



Soldering Process

jb 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. jb'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.

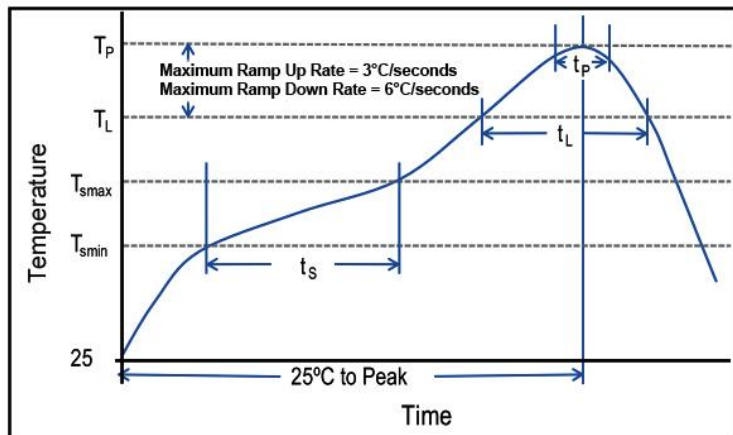
Hand soldering should be performed with care due to the difficulty in process control. If performed, care should be taken to avoid contact of the soldering iron to the molded case. The iron should be used to heat the solder pad, applying solder between the pad and the termination, until reflow occurs. 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.

Profile Feature	SnPb Assembly	Pb-Free Assembly
Preheat/Soak		
Temperature Minimum (T _{smin})	100°C	150°C
Temperature Maximum (T _{smax})	150°C	200°C
Time (ts) from T _{smin} to T _{smax}	60 – 120 seconds	60 – 120 seconds
Ramp-up Rate (T _L to T _p)	3°C/seconds maximum	3°C/seconds maximum
Liquidous Temperature (T _L)	183°C	217°C
Time Above Liquidous (t _L)	60 – 150 seconds	60 – 150 seconds
Peak Temperature (T _p)	220°C* , 235°C**	250°C* , 260°C**
Time within 5°C of Maximum Peak Temperature (t _p)	20 seconds maximum	30 seconds maximum
Ramp-down Rate (T _p to T _L)	6°C/seconds maximum	6°C/seconds maximum
Time 25°C to Peak Temperature	6 minutes maximum	8 minutes maximum

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

Please visit our website to get more update data, those data & specification are subject to change without notice.