



# LOW ESR TANTALUM CHIP CAPACITORS

## T Y P E E S R

### FEATURES

- Very low equivalent series resistance, ideal for power supplies
- High ripple and surge current capability
- Meets or exceeds EIA 535 BAAC and IECQ standards (QC300801/US0001, IS-28)
- Pre-conditioned, surge current tested for maximum robustness
- Capacitance range: 1.0  $\mu$ f to 680  $\mu$ f
- Voltage range: 4 to 50 WVDC
- Operating temperature range  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ ,  $2/3 \times V_r$  (linear derating) above  $+85^{\circ}\text{C}$
- Precision molded case with flat surfaces for vacuum pick-up
- Laser marking and bold videocon—readable polarity stripe
- Compliant terminations
- Glue pad on underside for bonding to circuit board prior to soldering
- Encapsulant material satisfies the UL 94 VO flammability classification

### DIMENSIONS

Millimeters (Inches)

Case Size	EIA Code	L $\pm 0.2$ ( $\pm 0.008$ )	W1 $\pm 0.2$ ( $\pm 0.008$ )	W2 $\pm 0.1$ ( $\pm 0.004$ )	H $\pm 0.2$ ( $\pm 0.008$ )	P $\pm 0.3$ ( $\pm 0.012$ )
A	3216	3.2 (.126)	1.6 (.063)	1.2 (.047)	1.6 (.063)	0.8 (.031)
B	3528	3.5 (.138)	2.8 (.110)	2.2 (.087)	1.9 (.075)	0.8 (.031)
C	6032	6.0 (.236)	3.2 (.126)	2.2 (.087)	2.5 (.098)	1.3 (.051)
D	7343	7.3 (.287)	4.3 (.169)	2.4 (.094)	2.8 (.110)	1.3 (.051)
H	7343H	7.3 (.287)	4.3 (.169)	2.4 (.094)	4.1 (.162)	1.3 (.051)

### LOW ESR PART NUMBERS AND ELECTRICAL SPECIFICATIONS

SMC P/N	DCL ( $\mu$ A)max.	tan $\delta$ max%	Maximum ESR at 100KHz milliohms	Maximum Ripple Current at 100KHz		
				25 $^{\circ}$ C	85 $^{\circ}$ C	125 $^{\circ}$ C
<b>4 V</b>						
ESR100-680K4D	27.2	14	100	1284	1156	513
<b>6.3 V</b>						
ESR1800-6.8K6.3A	0.5	6	1800	204	184	82
ESR1500-10K6.3A	0.6	6	1500	224	200	89
ESR1500-15K6.3A	0.9	6	1500	224	200	89
ESR900-22K6.3A	1.4	6	900	289	260	115
ESR600-22K6.3B	1.4	6	600	376	339	151
ESR600-33K6.3B	2.1	6	600	376	337	151
ESR400-33K6.3C	2.1	6	400	474	427	190
ESR500-47K6.3B	3	6	500	412	371	165
ESR300-47K6.3C	3	6	300	606	545	242
ESR500-68K6.3B	4.3	6	500	412	371	165
ESR150-68K6.3C	4.3	6	150	856	766	343
ESR200-68K6.3C	4.3	6	200	742	667	297
ESR150-100K6.3C	6.3	6	150	856	766	343
ESR150-150K6.3C	9.5	6	150	856	771	343
ESR250-150K6.3C	6.3	6	250	663	597	265
ESR125-150K6.3D	9.5	6	125	1095	980	438
ESR100-220K6.3C	13.9	10	100	1049	944	420
ESR250-220K6.3C	13.9	10	250	663	597	265
ESR100-220K6.3D	13.9	8	100	1125	1102	490
ESR100-330K6.3D	20.8	8	100	1125	1102	490
ESR100-330K6.3H	20.8	8	100	1285	1149	514
ESR150-330K6.3H	20.8	8	150	1049	944	420
ESR100-470K6.3D	29.6	12	100	1225	1102	490
ESR200-470K6.3D	29.6	12	200	866	779	346
ESR50-470K6.3H	29.6	10	50	1817	1635	727
ESR100-470K6.3H	29.6	10	100	1285	1156	514

# LOW ESR PART NUMBERS AND ELECTRICAL SPECIFICATIONS

SMEC P/N	DCL ( $\mu$ A)max.	tan $\delta$ max%	Maximum ESR at 100KHz milliohms	Maximum Ripple Current at 100KHz		
				25° C	85° C	125° C

## 10 V

ESR1800-2.2K10A	0.5	6	1800	204	184	82
ESR1400-4.7K10A	0.5	6	1400	231	208	93
ESR1800-6.8K10A	0.7	6	1800	204	184	82
ESR1800-10K10A	1	6	1800	204	183	82
ESR1000-15K10A	1.5	6	1000	274	246	110
ESR500-22K10B	2.2	6	500	412	371	165
ESR700-22K10B	2.2	6	700	348	312	139
ESR500-33K10B	3.3	6	500	412	371	165
ESR650-33K10B	3.3	6	650	362	325	145
ESR375-33K10C	3.3	6	375	542	484	217
ESR500-33K10C	3.3	6	500	469	420	188
ESR500-47K10B	4.7	8	500	412	371	165
ESR650-47K10B	4.7	8	650	362	325	145
ESR350-47K10C	4.7	6	350	561	501	224
ESR100-47K10D	4.7	6	100	1125	1102	490
ESR200-68K10C	6.8	6	200	741	667	296
ESR300-68K10C	6.8	6	300	605	544	242
ESR150-68K10D	6.8	6	150	1000	900	400
ESR100-100K10C	10	8	100	1049	944	420
ESR200-100K10C	10	8	200	742	667	297
ESR65-100K10D	10	6	65	1519	1367	607
ESR80-100K10D	10	6	80	1369	1225	548
ESR100-100K10D	10	6	100	1225	1095	490
ESR150-100K10D	10	6	150	1000	900	400
ESR100-150K10D	15	6	100	1225	1095	490
ESR100-220K10D	22	8	100	1125	1102	490
ESR150-220K10D	22	8	150	1000	894	400
ESR60-220K10H	22	8	60	1658	1483	663
ESR100-220K10H	22	8	100	1285	1149	514
ESR150-220K10H	22	8	150	1049	944	420
ESR100-330K10D	33	8	100	1225	1102	490
ESR150-330K10D	33	8	150	1000	900	400
ESR60-330K10H	33	8	60	1658	1483	663
ESR100-330K10H	33	8	100	1285	1149	514
ESR50-470K10H	33	10	50	1817	1625	727
ESR100-470K10H	47	10	100	1285	1149	574
ESR200-470K10H	47	10	200	908	817	363

## 16 V

ESR1800-2.2K16A	0.5	6	1800	204	183	81
ESR3500-2.2K16A	0.5	6	3500	146	131	59
ESR3500-3.3K16A	0.5	6	3500	146	131	59
ESR2000-4.7K16A	0.8	6	2000	194	174	77
ESR1500-4.7K16B	0.8	6	1500	238	214	95
ESR1800-4.7K16B	0.8	6	1800	217	195	86
ESR1200-6.8K16B	1.1	6	1200	266	240	106
ESR800-10K16B	1.6	6	800	326	293	130
ESR800-15K16B	2.4	6	800	326	292	130
ESR375-22K16B	3.5	6	375	476	428	190

# LOW ESR PART NUMBERS AND ELECTRICAL SPECIFICATIONS

SMC P/N	DCL ( $\mu$ A)max.	tan $\delta$ max%	Maximum ESR at 100KHz milliohms	Maximum Ripple Current at 100KHz		
				25° C	85° C	125° C

## 16 V continued

ESR600-22K16B	3.5	6	600	376	338	150
ESR300-22K16C	3.5	6	300	605	545	242
ESR375-22K16C	3.5	6	375	542	484	217
ESR300-33K16C	5.3	6	300	606	545	242
ESR350-47K16C	7.5	6	350	561	501	224
ESR150-47K16D	7.5	6	150	1000	894	400
ESR200-68K16C	10.9	6	200	741	667	296
ESR150-68K16D	10.9	6	150	1000	894	400
ESR100-100K16D	16	6	100	1225	1102	490
ESR125-100K16D	16	6	125	1095	980	438
ESR100-100K16H	16	6	100	1285	1149	514
ESR125-150K16D	24	6	125	1095	986	438
ESR150-150K16D	24	6	150	1000	900	400
ESR100-220K16H	35.2	10	100	1285	1156	514

## 20 V

ESR3000-2.2K20A	0.5	6	3000	158	142	63
ESR2500-3.3K20A	0.7	6	2500	173	156	69
ESR1800-4.7K20A	0.9	6	1800	204	183	82
ESR700-6.8K20C	1.4	6	700	396	357	159
ESR1000-10K20B	2	6	1000	292	261	117
ESR700-10K20C	2	6	700	396	357	159
ESR450-15K20C	3	6	450	494	442	198
ESR400-22K20C	4.4	6	400	524	472	210
ESR300-22K20D	4.4	6	300	707	636	283
ESR200-33K20D	6.6	6	200	866	775	346
ESR200-47K20D	9.4	6	200	866	779	346
ESR125-47K20H	9.4	6	125	1149	1034	460
ESR150-47K20H	9.4	6	150	1049	938	420
ESR200-68K20D	13.6	6	200	866	779	346
ESR300-68K20D	13.6	6	300	707	636	283
ESR125-68K20H	13.6	6	125	1149	1028	460
ESR150-68K20H	13.6	6	150	1049	938	420
ESR150-100K20H	20	6	150	1049	944	420
ESR200-100K20H	20	6	200	908	817	363

## 25 V

ESR3000-1.5K25A	0.4	6	3000	158	141	63
ESR2500-2.2K25B	0.6	6	2500	184	166	74
ESR2000-3.3K25B	0.8	6	2000	206	186	82
ESR700-3.3K25C	0.8	6	700	396	357	159
ESR1500-4.7K25B	1.2	6	1500	238	213	95
ESR600-6.8K25C	1.7	6	600	428	385	171
ESR700-6.8K25C	1.7	6	700	396	357	159
ESR500-10K25C	2.5	6	500	469	420	188
ESR300-15K25D	3.8	6	300	707	636	283
ESR200-22K25D	5.5	6	200	866	775	346
ESR300-33K25D	8.3	6	300	707	636	283
ESR175-33K25H	8.3	6	175	971	868	388

# LOW ESR PART NUMBERS AND ELECTRICAL SPECIFICATIONS

SMEC P/N	DCL ( $\mu$ A)max.	tan $\delta$ max%	Maximum ESR at 100KHz milliohms	Maximum Ripple Current at 100KHz		
				25° C	85° C	125° C

## 25 V continued

ESR200-33K25H	8.3	6	200	908	812	363
ESR250-47K25D	8.3	6	250	775	697	310
ESR125-68K25H	17	6	125	1149	1034	459
ESR200-68K25H	17	6	200	908	817	363

## 35 V

ESR3000-1K35A	0.5	4	3000	158	142	63
ESR2000-1K35B	0.5	4	2000	206	186	82
ESR2500-1.5K35B	0.5	6	2500	184	166	74
ESR2000-2.2K35B	0.8	6	2000	206	186	82
ESR700-3.3K35C	1.2	6	700	396	357	159
ESR1500-4.7K35B	1.6	6	1500	238	213	95
ESR600-4.7K35C	1.6	6	600	428	383	171
ESR500-6.8K35D	2.4	6	500	548	493	219
ESR300-10K35D	3.5	6	300	707	632	283
ESR200-10K35H	3.5	6	200	908	817	363
ESR450-15K35C	5.3	6	450	494	445	198
ESR300-15K35D	5.3	6	300	707	632	283
ESR400-22K35D	7.7	6	400	612	548	245
ESR200-22K35H	7.7	6	200	908	812	363
ESR300-22K35H	7.7	6	300	742	663	297
ESR300-33K35D	11.6	6	300	707	636	283
ESR200-47K35H	16.5	6	200	908	817	363
ESR250-47K35H	16.5	6	250	812	731	325

## 50 V

ESR700-4.7K50D	2.4	6	700	463	417	185
ESR600-6.8K50D	3.4	6	600	500	450	200

M =  $\pm$  / -20% tolerance available.

ESR values presented in the tables are based on the industry standard 100KHz sinusoidal waveform with 2.2 DC bias.

Ripple Ratings are based on ESR levels as supplied and power dissipation for D case size is 150 mW.

Allow 25% increase to ripple ratings post PCB assembly.

Packaging: 500 pcs. / per reel, reel size 7 in. standard. 3,000 pcs. / per reel, reel size 13 in. available.