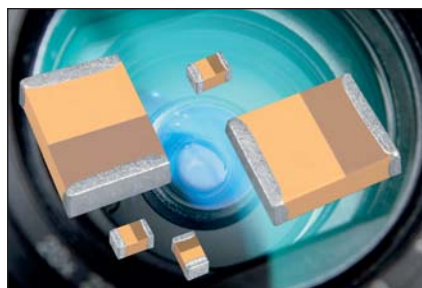


TLC Series



Tantalum Solid Electrolytic Chip Capacitors Consumer Series



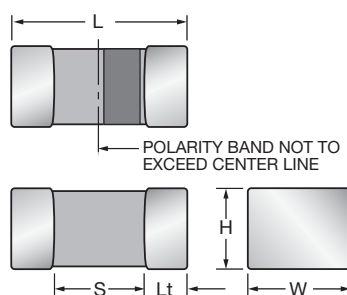
FEATURES

- High capacitance vs. voltage ratio
- Super high volumetric efficiency
- CV range: 0.47-220 μ F / 2-35V
- 12 case sizes available
- Consumer applications (portable handheld electronics, cellular phones, digital equipments etc.)



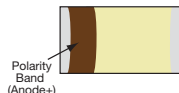
APPLICATIONS

- Consumer portable applications with space limitations

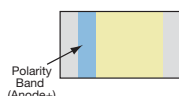


MARKING

A, D, H, J, K, L, M, R, T,
U, V, Z CASE



E CASE



CASE DIMENSIONS: millimeters (inches)

Code	EIA Code	EIA Metric	L+0.20 (0.008) -0.00 (0.000)	W+0.15 (0.006) -0.00 (0.000)	H+0.15 (0.006) -0.00 (0.000)	Termination Spacing(S)	Minimum Termination Length (Lt)
A	1206	3216-18	3.20 $\pm$ 0.20 (0.126 $\pm$ 0.008)	1.60 $\pm$ 0.20 (0.063 $\pm$ 0.008)	1.60 $\pm$ 0.20 (0.063 $\pm$ 0.008)	1.80 (0.071) min	0.15 (0.006)
D	1206	3216-06	3.20 $\pm$ 0.20 (0.126 $\pm$ 0.008)	1.60 $\pm$ 0.20 (0.063 $\pm$ 0.008)	0.60 (0.024) max	1.80 (0.071) min	0.15 (0.006)
E**	0201	0603-03	0.60 $\pm$ 0.12 (0.024 $\pm$ 0.005)	0.33 $\pm$ 0.02 (0.013 $\pm$ 0.001)	0.33 $\pm$ 0.02 (0.013 $\pm$ 0.001)	0.20 (0.008) min	0.10 (0.004)
H	0805	2012-10	2.00 (0.079)	1.35 (0.053)	1.00 (0.039) max	0.70 (0.028) min	0.15 (0.006)
J	0603	1608-08	1.60 (0.063)	0.85 (0.033)	0.75 (0.030) max	0.55 (0.022) min	0.15 (0.006)
K	0402	1005-07	1.00 (0.039)	0.50 $\pm$ 0.20 -0.00 (0.020 +0.008 -0.000)	0.50 $\pm$ 0.20 -0.00 (0.020 +0.008 -0.000)	0.40 (0.016) min	0.10 (0.004)
L	0603	1608-10	1.60 (0.063)	0.85 (0.033)	0.85 (0.033)	0.55 (0.022) min	0.15 (0.006)
M	0803	2008-10	2.00 (0.079)	0.85 (0.033)	0.85 (0.033)	0.70 (0.028) min	0.15 (0.006)
R	0805	2012-15	2.00 (0.079)	1.35 (0.053)	1.35 (0.053)	0.70 (0.028) min	0.15 (0.006)
T	1210	3528-12	3.50 $\pm$ 0.20 (0.138 $\pm$ 0.008)	2.80 $\pm$ 0.20 -0.10 (0.110 +0.008 -0.004)	1.20 (0.047) max	2.00 (0.079) min	0.15 (0.006)
U	0805	2012-06	2.00 (0.079)	1.35 (0.053)	0.60 (0.024) max	0.70 (0.028) min	0.15 (0.006)
V	1206	3216-08	3.20 $\pm$ 0.20 (0.126 $\pm$ 0.008)	1.60 $\pm$ 0.20 (0.063 $\pm$ 0.008)	0.75 (0.030) max	1.80 (0.071) min	0.15 (0.006)
Z	0602	1605-07	1.60 (0.063)	0.50 $\pm$ 0.20 -0.00 (0.020 +0.008 -0.000)	0.50 $\pm$ 0.20 -0.00 (0.020 +0.008 -0.000)	0.55 (0.022) min	0.15 (0.006)

**Please contact manufacturer, availability upon request

Under development

HOW TO ORDER

TLC

Type

L

Case Size
See table above

226

Capacitance Code
pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)

M

Tolerance
M=±20%

006

Rated DC Voltage
002=2Vdc
003=3Vdc
004=4Vdc
006=6.3Vdc
008=8Vdc
010=10Vdc
016=16Vdc
020=20Vdc
025=25Vdc
035=35Vdc

R

Packaging
R, P = 7" Standard Tin Termination Plastic Tape
X, Q = 4 1/4" Standard Tin Termination Plastic Tape
A, M = 7" Gold Termination Plastic Tape
F, N = 4 1/4" Gold Termination Plastic Tape
H = Chip Tray (waffle) Only case E

TA

Standard Suffix
OR
4000
ESR in mΩ

Tantalum Solid Electrolytic Chip Capacitors Consumer Series

TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25°C											
Capacitance Range:	0.47 μ F to 220 μ F											
Capacitance Tolerance:	$\pm 20\%$											
Rated Voltage (V_R)	-55°C $\leq$ +40°C:	2	3	4	6.3	8	10	16	20	25	35	
Category Voltage (V_C)	at 85°C:	1	1.5	2	3.2	4	5	8	10	12.5	17.5	
Category Voltage (V_C)	at 125°C:	0.4	0.6	0.8	1.3	1.6	2	3.2	4	5	7	
Temperature Range:	-55°C to +125°C with category voltage											
Reliability:	0.2% per 1000 hours at 85°C, 0.5x V_R with 0.1 Ω /V series impedance with 60% confidence level											

CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Voltage Rating DC (V_R) to 40°C									
μ F	Code	2.0V	3.0V	4.0V	6.3V	8V	10V	16V	20V	25V	35V
0.47	474				E**			K			
1.0	105				E**			K		L	R
2.2	225						K		H	R	
3.3	335							L			
4.7	475			K	K/U		J				
6.8	685		K	K			U				
10	106		K	J/K/Z	J/K/Z		U	V	R		
15	156	K	K*	K			H/L				
22	226	J	J	K*/U	L/U		L/M				
33	336			L/U	H/L/L(4000)/U/V	L	H				
47	476	L	L/R	H/L	H/L/R/V	D	H/R				
68	686			R	R		R*				
100	107			I*/R	D*/I*/R/T		R*/T				
150	157			R*	R*		A*				
220	227	R*		R*/T							

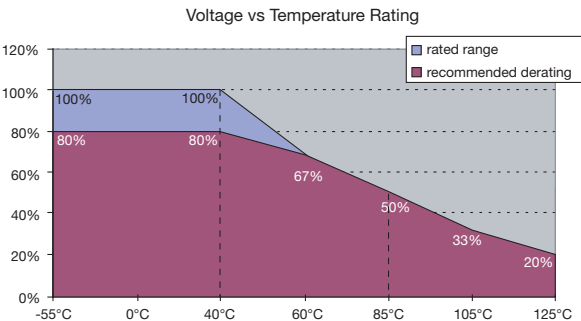
Available Ratings, (ESR ratings in mOhms in brackets)

Engineering samples - please contact manufacturer

*Codes under development - subject to change.

**Please contact manufacturer, availability upon request

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.



TLC Series



Tantalum Solid Electrolytic Chip Capacitors Consumer Series

RATINGS & PART NUMBER REFERENCE

AVX Part No.	Case Size	Capacitance (µF)	Rated Voltage (V)	Rated Temperature (°C)	Category Voltage (V)	Category Temperature (°C)	DCL Max. (µA)	ESR Max. @ 100kHz (Ω)	MSL	100kHz RMS Current (mA)		
										25°C	85°C	125°C
2 Volt @ 40°C												
TLCK156M002#TA	K	15	2	40	0.4	125	0.5	15	3	32	28	13
TLCJ226M002#TA	J	22	2	40	0.4	125	0.5	7.5	3	52	46	21
TLCL476M002#TA	L	47	2	40	0.4	125	0.9	7.5	3	58	52	23
3 Volt @ 40°C												
TLCK685M003#TA	K	6.8	3	40	0.6	125	0.5	15	3	32	28	13
TLCK106M003#TA	K	10	3	40	0.6	125	0.5	15	3	32	28	13
TLCJ226M003#TA	J	22	3	40	0.6	125	0.7	7.5	3	52	46	21
TLCL476M003#TA	L	47	3	40	0.6	125	1.4	7.5	3	58	52	23
TLCR476M003#TA	R	47	3	40	0.6	125	3.0	7.5	3	77	70	31
4 Volt @ 40°C												
TLCK475M004#TA	K	4.7	4	40	0.8	125	0.5	15	3	32	28	13
TLCK685M004#TA	K	6.8	4	40	0.8	125	0.5	15	3	32	28	13
TLCJ106M004#TA	J	10	4	40	0.8	125	0.5	7.5	3	52	46	21
TLCK106M004#TA	K	10	4	40	0.8	125	0.5	15	3	32	28	13
TLCZ106M004#TA	Z	10	4	40	0.8	125	0.5	15	3	37	33	15
TLCK156M004#TA	K	15	4	40	0.8	125	3.0	15	3	32	28	13
TLCU226M004#TA	U	22	4	40	0.8	125	0.9	12	3	54	49	22
TLCL336M004#TA	L	33	4	40	0.8	125	1.3	7.5	3	58	52	23
TLCU336M004#TA	U	33	4	40	0.8	125	2.6	9	3	62	56	25
TLCH476M004#TA	H	47	4	40	0.8	125	1.9	5	3	89	80	36
TLCL476M004#TA	L	47	4	40	0.8	125	1.9	7.5	3	58	52	23
TLCR686M004#TA	R	68	4	40	0.8	125	2.7	5	3	95	85	38
TLCR107M004#TA	R	100	4	40	0.8	125	4.0	5	3	95	85	38
TLCT227M004#TA	T	220	4	40	0.8	125	8.8	1	3	200	180	80
6.3 Volt @ 40°C												
TLCE474M006HTA**	E	0.47	6.3	40	1.3	125	1.0	60	3	13	12	5
TLCE105M006HTA**	E	1	6.3	40	1.3	125	1.0	60	3	13	12	5
TLCK475M006#TA	K	4.7	6.3	40	1.3	125	0.5	15	3	32	28	13
TLCU475M006#TA	U	4.7	6.3	40	1.3	125	0.5	5	3	84	75	33
TLCK106M006#TA	J	10	6.3	40	1.3	125	0.6	7.5	3	52	46	21
TLCK106M006#TA	K	10	6.3	40	1.3	125	3.1	15	3	32	28	13
TLCZ106M006#TA	Z	10	6.3	40	1.3	125	0.6	15	3	37	33	15
TLCL226M006#TA	L	22	6.3	40	1.3	125	1.4	7.5	3	58	52	23
TLCU226M006#TA	U	22	6.3	40	1.3	125	2.8	12	3	54	49	22
TLCH336M006#TA	H	33	6.3	40	1.3	125	2.0	5	3	89	80	36
TLCL336M006#TA	L	33	6.3	40	1.3	125	2.1	7.5	3	58	52	23
TLCL336M006#4000	L	33	6.3	40	1.3	125	2.1	4	3	79	71	32
TLCU336M006#TA	U	33	6.3	40	1.3	125	10.4	7.5	3	68	61	27
TLCV336M006#TA	V	33	6.3	40	1.3	125	4.2	5	3	84	75	33
TLCH476M006#TA	H	47	6.3	40	1.3	125	3.0	5	3	89	80	36
TLCL476M006#TA	L	47	6.3	40	1.3	125	29.6	10	3	50	45	20
TLCR476M006#TA	R	47	6.3	40	1.3	125	6.0	5	3	95	85	38
TLCV476M006#TA	V	47	6.3	40	1.3	125	6.0	15	3	48	43	19
TLCR686M006#TA	R	68	6.3	40	1.3	125	4.3	5	3	95	85	38
TLCR107M006#TA	R	100	6.3	40	1.3	125	6.0	5	3	95	85	38
TLCT107M006#TA	T	100	6.3	40	1.3	125	31.5	15	3	52	46	21
8 Volt @ 40°C												
TLCL336M008#TA	L	33	8	40	1.6	125	26.4	10	3	50	45	20
TLCD476M008#TA	D	47	8	40	1.6	125	18.8	7	3	71	64	28
10 Volt @ 40°C												
TLCK225M010#TA	K	2.2	10	40	2	125	0.5	15	3	32	28	13
TLCJ475M010#TA	J	4.7	10	40	2	125	0.5	10	3	45	40	18
TLCU685M010#TA	U	6.8	10	40	2	125	0.7	5	3	84	75	33
TLCU106M010#TA	U	10	10	40	2	125	1.0	5	3	84	75	33
TLCH156M010#TA	H	15	10	40	2	125	1.5	5	3	58	52	23
TLCL156M010#TA	L	15	10	40	2	125	1.5	7.5	3	89	80	36
TLCL226M010#TA	L	22	10	40	2	125	11	10	3	50	45	20
TLCM226M010#TA	M	22	10	40	2	125	2.2	7.5	3	63	57	25
TLCH336M010#TA	H	33	10	40	2	125	3.3	5	3	89	80	36
TLCH476M010#TA	H	47	10	40	2	125	23.5	7.5	3	73	66	29
TLCR476M010#TA	R	47	10	40	2	125	4.7	5	3	95	85	38
TLCT107M010#TA	T	100	10	40	2	125	10	1	3	200	180	80
16 Volt @ 40°C												
TLCK474M016#TA	K	0.47	16	40	3.2	125	0.5	15	3	32	28	13
TLCK105M016#TA	K	1	16	40	3.2	125	0.8	15	3	32	28	13
TLCL335M016#TA	L	3.3	16	40	3.2	125	0.5	7.5	3	58	52	23
TLCV106M016#TA	V	10	16	40	3.2	125	1.6	2	3	132	119	53

TLC Series



Tantalum Solid Electrolytic Chip Capacitors Consumer Series

RATINGS & PART NUMBER REFERENCE

AVX Part No.	Case Size	Capacitance (μF)	Rated Voltage (V)	Rated Temperature (°C)	Category Voltage (V)	Category Temperature (°C)	DCL Max. (μA)	ESR Max. @ 100kHz (Ω)	MSL	100kHz RMS Current (mA)		
										25°C	85°C	125°C
20 Volt @ 40°C												
TLCH225M020#TA	H	2.2	20	40	4	125	0.5	7.5	3	89	80	36
TLCR106M020#TA	R	10	20	40	4	125	0.6	5	3	95	85	38
25 Volt @ 40°C												
TLCL105M025#TA	L	1.0	25	40	5	125	0.5	7.5	3	58	85	23
TLCR225M025#TA	R	2.2	25	40	5	125	0.6	5	3	95	85	38
35 Volt @ 40°C												
TLCR105M035#TA	R	1.0	35	40	7	125	0.5	5	3	95	85	38

**Please contact manufacturer, availability upon request

Moisture Sensitivity Level (MSL) is defined according to J-STD-020.

All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.2 volts.

DCL is measured at rated voltage after 5 minutes.

DCL allowed to move up to 2.00 times the limit post mounting.

For typical weight and composition see page 223.

NOTE: AVX reserves the right to supply a higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.

QUALIFICATION TABLE

TEST	TLC series (Temperature range -55°C to +125°C)												
	Condition				Characteristics								
Endurance	Determine after application of rated voltage for 2000 +48/-0 hours at 40±2°C and then leaving 1-2 hours at room temperature. Also determine of 85°C temperature, category voltage for 2000 +48/-0 hours and then leaving 1-2 hours at room temperature. Power supply impedance to be ≤0.1Ω/V.				Visual examination	no visible damage							
					DCL	1.25 x initial limit							
					ΔC/C	within ±30% of initial value							
					ESR	1.5 x initial limit							
Humidity	Determine after storage without applied voltage at 40±2°C and 90-95% relative humidity for 56 days and then recovery 1-2 hours at room temperature.				Visual examination	no visible damage							
					DCL	2 x initial limit							
					ΔC/C	±30% of initial value							
					ESR	1.25 x initial limit							
Temperature Stability	Step	Temperature°C	Duration (min)	Voltage Applied		+20°C	-55°C	+20°C	+40°C	+60°C	+85°C	+125°C	+20°C
	1	+20±2	15	N/A	DCL	IL*	n/a	IL*	1.25 x IL*	1.25 x IL*	1.25 x IL*	1.25 x IL*	IL*
	2	-55+0/-3	15	N/A									
	3	+20±2	15	N/A									
	4	+40+2/-0	15	V _R	ΔC/C	n/a	+0/-25%	±5%	+10/-0%	+10/-0%	+20/-0%	+25/-0%	+20/-10%
	5	+60+2/-0	15	0.66 x V _R									
	6	+85+3/-0	15	0.50 x V _R									
	7	+125+3/-0	15	0.20 x V _R	ESR	IL*	n/a	1.25 x IL*	1.25 x IL*	1.25 x IL*	1.25 x IL*	1.25 x IL*	1.25 x IL*
	8	+20±2	15	N/A									
Surge Voltage	Test temperature: 40°C+3/0°C Test voltage: 1.3 x rated voltage Series protection resistance 1000±100Ω Discharge resistance: 1000Ω Number of cycles: 1000x Cycle duration: 6 min; 30 sec charge, 5 min 30 sec discharge				Visual examination	no visible damage							
					DCL	2 x initial limit							
					ΔC/C	within ±30% of initial value							
					ESR	1.25 x initial limit							

*Initial Limit

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

AVX:

TLCK475M004QTA	TLCK106M003QTA	TLCL226M006RTA	TLCR225M025RTA	TLCR476M006XTA
TLCR476M010XTA	TLCR225M025XTA	TLCL105M025XTA	TLCT227M004RTA	TLCL105M025RTA
TLCK106M003PTA	TLCL476M002RTA	TLCH156M010XTA	TLCT107M010XTA	TLCL156M010XTA
TLCH225M020RTA	TLCK225M010QTA	TLCL336M004XTA	TLCK475M006PTA	TLCZ106M006PTA
TLCZ106M004PTA	TLCK106M004QTA	TLCK106M006QTA	TLCK685M004PTA	TLCL335M016RTA
TLCR105M035RTA	TLCR107M006RTA	TLCU106M010RTA	TLCL226M006XTA	TLCL476M003RTA
TLCR107M004XTA	TLCR686M004RTA	TLCJ226M003RTA	TLCK225M010PTA	TLCL476M004RTA
TLCR476M006RTA	TLCL336M006RTA	TLCK156M004PTA	TLCK106M004PTA	TLCZ106M006QTA
TLCL336M006R4000	TLCV106M016ATA	TLCL336M004RTA	TLCJ106M004RTA	TLCK475M004PTA
TLCK475M006QCX	TLCV106M016FTA	TLCV106M016XTA	TLCJ226M002RTA	TLCK474M016PTA
TLCL156M010XTX	TLCR107M004RTA	TLCK106M006PTA	TLCR106M020RTA	TLCL476M002XTA
TLCT227M004XTA	TLCR476M010RTA	TLCK474M016QTA	TLCK156M004QTA	TLCK105M016QTA
TLCL336M008RTA	TLCD476M008RTA	TLCE474M006HTA	TLCD476M008XTA	TLCH476M010XTA
TLCU336M004XTA	TLCU226M006XTA	TLCU226M004XTA	TLCU336M006XTA	TLCJ475M010RTA
TLCL476M006RTA				