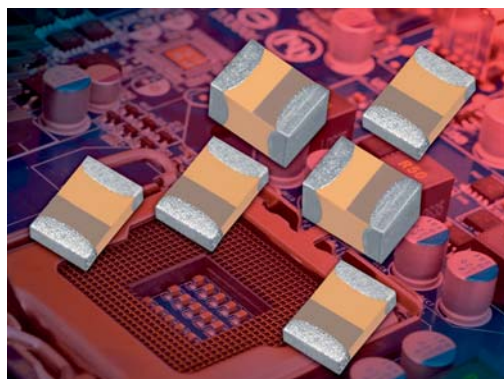


TPC Series

Low ESR TACmicrochip®



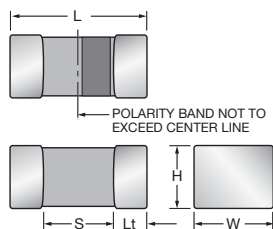
FEATURES

- Low ESR TACmicrochip® capacitor
- Smallest and low profile tantalum
- CV range: 1.0-100µF / 3-25V
- 4 case sizes available
- Power supply applications



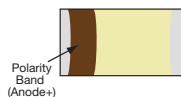
APPLICATIONS

- Portable controller with elevated power requirements



MARKING

H, K, L, R CASE



CASE DIMENSIONS: millimeters (inches)

Code	EIA Code	EIA Metric	L+0.20 (0.008) -0.00 (0.000)	W+0.15 (0.008) -0.00 (0.000)	H+0.15 (0.008) -0.00 (0.000)	Termination Spacing(S)	Minimum Termination Length (Lt)
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)
K	0402	1005-07	1.00 (0.039)	+0.20 0.50 -0.00 (0.020 +0.008 -0.000)	+0.20 0.50 -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)
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)

HOW TO ORDER

TPC	R	106	*	010	R	1800
Type TACmicrochip®	Case Size See table above	Capacitance Code pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	Tolerance K=±10% M=±20%	Rated DC Voltage 003=3Vdc 004=4Vdc 006=6.3Vdc 010=10Vdc 016=16Vdc 020=20Vdc 025=25Vdc	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	ESR in mΩ

TECHNICAL SPECIFICATIONS

Technical Data:		All technical data relate to an ambient temperature of +25°C						
Capacitance Range:		1.0 µF to 100 µF						
Capacitance Tolerance:		±10%; ±20%						
Leakage Current DCL:		0.01CV or 0.5µA whichever is the greater						
Rated Voltage (V _R)	≤ +85°C:	3	4	6.3	10	16	20	25
Category Voltage (V _C)	≤ +125°C:	2	2.7	4	7	10	13	17
Surge Voltage (V _S)	≤ +85°C:	3.9	5.2	8	13	20	26	32
Surge Voltage (V _S)	≤ +125°C:	2.6	3.2	5	8	12	16	20
Temperature Range:		-55°C to +125°C						
Reliability:		1% per 1000 hours at 85°C, V _R with 0.1Ω/V series impedance, 60% confidence level						
Termination Finish:		Nickel and Tin Plating (standard), Nickel and Gold Plating option available upon request						

CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Voltage Rating DC (V_R) at 85°C						
μF	Code	3.0V	4.0V	6.3V	10V	16V	20V	25V
1.0	105				L(5000)			R(3000)
1.5	155							
2.2	225			K(8000)/L(5000)	L(5000)	L(5000)		
3.3	335				L(5000)			
4.7	475	K(8000)			L(5000)		R(1500)*	
6.8	685							
10	106			L(4000)	H(2500) L(4000), R(1800)	R(1800)		
15	156			R(1800)	R(1500)			
22	226		L(5000)/R(1800)	R(1500)	R(1500)			
33	336	R(1800)	H(1500)/R(1500)		R(1500)			
47	476	R(1500)		R(1800)				
68	686							
100	107		R(1000)					

Codes shown are examples of ESR values offered on certain CV and case size.
Other codes and ESR values available upon request.

Available Ratings, (ESR ratings in mOhms in brackets)

Engineering samples - please contact manufacturer

*Code under development – subject to change

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

TPC Series



Low ESR TACmicrochip®

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)	DF Max. (%)	ESR Max. @ 100kHz (mΩ)	MSL	100kHz RMS Current (A)			Product Category
											25°C	85°C	125°C	
3 Volt @ 85°C														
TPCK475*003#8000	K	4.7	3	85	2	125	0.5	12	8000	1	0.043	0.039	0.017	3
TPCR336*003#1800	R	33	3	85	2	125	1.0	10	1800	1	0.158	0.142	0.063	2
TPCR476*003#1500	R	47	3	85	2	125	1.5	10	1500	1	0.173	0.156	0.069	3
4 Volt @ 85°C														
TPCL226*004#5000	L	22	4	85	2.7	125	0.9	6	5000	1	0.071	0.064	0.028	3
TPCR226*004#1800	R	22	4	85	2.7	125	0.9	8	1800	1	0.158	0.142	0.063	1
TPCH336*004#1500	H	33	4	85	2.7	125	1.3	14	1500	1	0.163	0.147	0.065	3
TPCR336*004#1500	R	33	4	85	2.7	125	1.3	10	1500	1	0.173	0.156	0.069	2
TPCR107*004#1000	R	100	4	85	2.7	125	4.0	30	1000	1	0.212	0.191	0.085	3
6.3 Volt @ 85°C														
TPCK225*006#8000	K	2.2	6.3	85	4	125	0.5	8	8000	1	0.043	0.039	0.017	3
TPCL225*006#5000	L	2.2	6.3	85	4	125	0.5	6	5000	1	0.071	0.064	0.028	1
TPCL106*006#4000	L	10	6.3	85	4	125	0.6	10	4000	1	0.079	0.071	0.032	3
TPCR156*006#1800	R	15	6.3	85	4	125	0.9	8	1800	1	0.158	0.142	0.063	1
TPCR226*006#1500	R	22	6.3	85	4	125	1.4	10	1500	1	0.173	0.156	0.069	1
TPCR476*006#1800	R	47	6.3	85	4	125	3.0	20	1800	1	0.158	0.142	0.063	3
10 Volt @ 85°C														
TPCL105*010#5000	L	1.0	10	85	7	125	0.5	6	5000	1	0.071	0.064	0.028	1
TPCL225*010#5000	L	2.2	10	85	7	125	0.5	6	5000	1	0.071	0.064	0.028	1
TPCL335*010#5000	L	3.3	10	85	7	125	0.5	8	5000	1	0.071	0.064	0.028	2
TPCL475*010#5000	L	4.7	10	85	7	125	0.5	10	5000	1	0.071	0.064	0.028	2
TPCH106*010#2500	H	10	10	85	7	125	1.0	8	2500	1	0.126	0.113	0.050	2
TPCL106*010#4000	L	10	10	85	7	125	1.0	20	4000	1	0.079	0.071	0.032	3
TPCR106*010#1800	R	10	10	85	7	125	1.0	8	1800	1	0.158	0.142	0.063	1
TPCR156*010#1500	R	15	10	85	7	125	1.5	10	1500	1	0.173	0.156	0.069	1
TPCR226*010#1500	R	22	10	85	7	125	2.2	14	1500	1	0.173	0.156	0.069	2
TPCR336*010#1500	R	33	10	85	7	125	3.3	20	1500	1	0.173	0.156	0.069	3
16 Volt @ 85°C														
TPCL225*016#5000	L	2.2	16	85	10	125	0.5	10	5000	1	0.071	0.064	0.028	1
TPCR106*016#1800	R	10	16	85	10	125	1.6	10	1800	1	0.158	0.142	0.063	2
20 Volt @ 85°C														
TPCR475*020#1500	R	4.7	20	85	13	125	0.9	8	1500	1	0.173	0.156	0.069	1
25 Volt @ 85°C														
TPCR105*025#3000	R	1.0	25	85	17	125	0.5	8	3000	1	0.122	0.110	0.049	1

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.

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 – CATEGORY 1

TEST	TPC series (Temperature range -55°C to +125°C)									
	Condition			Characteristics						
Endurance	Determine after application of rated voltage for 2000 +48/-0 hours at 85±2°C and then leaving 1-2 hours at room temperature. Also determine of 125°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 ±10% of initial value					
				DF	1.5 x initial limit					
				ESR	1.5 x initial limit					
Humidity	Determine after storage without applied voltage at 40±2°C and 90-95% relative humidity for 1344 +48/-0 hours and then recovery 1-2 hours at room temperature			Visual examination	no visible damage					
				DCL	initial limit					
				ΔC/C	within ±5% of initial value					
				DF	1.2 x initial limit					
				ESR	1.2 x initial limit					
Temperature Stability	Step	Temperature°C	Duration(min)		+20°C	-55°C	+20°C	+85°C	+125°C	+20°C
	1	+20±2	15	DCL	IL*	n/a	IL*	10 x IL*	12.5 x IL*	IL*
	2	-55+0/-3	15							
	3	+20±2	15	ΔC/C	n/a	+0/-10%	±5%	+10/-0%	+15/-0%	±5%
	4	+85+3/-0	15	DF	IL*	1.5 x IL*	IL*	1.5 x IL*	2 x IL*	IL*
	5	+125+3/-0	15	ESR	IL*	1.25 x IL*	IL*	1.25 x IL*	2 x IL*	IL*
	6	+20±2	15							
Surge Voltage	Test temperature: 85°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	initial limit					
				ΔC/C	within ±10% of initial value					
				DF	initial limit					
				ESR	initial limit					

*Initial Limit

QUALIFICATION TABLE – CATEGORY 2

TEST	TPC series (Temperature range -55°C to +125°C)									
	Condition			Characteristics						
Endurance	Determine after application of rated voltage for 2000 +48/-0 hours at 85±2°C and then leaving 1-2 hours at room temperature. Also determine of 125°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 ±15% of initial value					
				DF	1.5 x initial limit					
				ESR	1.5 x initial limit					
Humidity	Determine after storage without applied voltage at 40±2°C and 90-95% relative humidity for 1344 +48/-0 hours and then recovery 1-2 hours at room temperature			Visual examination	no visible damage					
				DCL	initial limit					
				ΔC/C	within ±10% of initial value					
				DF	1.2 x initial limit					
				ESR	1.2 x initial limit					
Temperature Stability	Step	Temperature°C	Duration(min)		+20°C	-55°C	+20°C	+85°C	+125°C	+20°C
	1	+20±2	15	DCL	IL*	n/a	IL*	10 x IL*	12.5 x IL*	IL*
	2	-55+0/-3	15							
	3	+20±2	15	ΔC/C	n/a	+0/-15%	±5%	+15/-0%	+20/-0%	±5%
	4	+85+3/-0	15	DF	IL*	1.5 x IL*	IL*	1.5 x IL*	2 x IL*	IL*
	5	+125+3/-0	15	ESR	IL*	1.25 x IL*	IL*	1.25 x IL*	2 x IL*	IL*
	6	+20±2	15							
Surge Voltage	Test temperature: 85°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	1.5 x initial limit					
				ΔC/C	within ±15% of initial value					
				DF	1.5 x initial limit					
				ESR	1.5 x initial limit					

*Initial Limit

QUALIFICATION TABLE – CATEGORY 3

TEST	TPC series (Temperature range -55°C to +125°C)									
	Condition			Characteristics						
Endurance	Determine after application of rated voltage for 2000 +48/-0 hours at 85±2°C and then leaving 1-2 hours at room temperature. Also determine of 125°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					
				DF	1.5 x initial limit					
				ESR	1.5 x initial limit					
Humidity	Determine after storage without applied voltage at 40±2°C and 90-95% relative humidity for 1344 +48/-0 hours and then recovery 1-2 hours at room temperature			Visual examination	no visible damage					
				DCL	2 x initial limit					
				ΔC/C	within ±30% of initial value					
				DF	1.5 x initial limit					
				ESR	1.25 x initial limit					
Temperature Stability	Step	Temperature°C	Duration(min)		+20°C	-55°C	+20°C	+85°C	+125°C	+20°C
	1	+20±2	15	DCL	IL*	n/a	IL*	10 x IL*	12.5 x IL*	IL*
	2	-55+0/-3	15							
	3	+20±2	15	ΔC/C	n/a	+0/-25%	±5%	+20/-0%	+25/-0%	±20%
	4	+85+3/-0	15	DF	IL*	1.5 x IL*	IL*	1.5 x IL*	2 x IL*	1.5 x IL*
	5	+125+3/-0	15							
	6	+20±2	15	ESR	IL*	1.25 x IL*	IL*	1.25 x IL*	2 x IL*	1.5 x IL*
Surge Voltage	Test temperature: 85°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					
				DF	2 x initial limit					
				ESR	2 x initial limit					

*Initial Limit

Mouser Electronics

Authorized Distributor

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

AVX:

TPCR106M010A1800	TPCL335K010R5000	TPCL335M010R5000	TPCR156K006R1800	TPCR226M006R1500
TPCR476M003R1500	TPCR226K004R1800	TPCR106M010X1800	TPCR106M016R1800	TPCR106M016X1800
TPCR156M006R1800	TPCR156M010X1500	TPCR105M025R3000	TPCR106K016R1800	TPCR226K006R1500
TPCR336K003R1800	TPCL105M010R5000	TPCL106M006R4000	TPCL335K010X5000	TPCL475M010R5000
TPCR105K025R3000	TPCR105K025X3000	TPCR106M010R1800	TPCR106M016F1800	TPCR156K010R1500
TPCR156K010X1500	TPCR156M010R1500	TPCH106K010R2500	TPCH336M004R1500	TPCK225M006P8000
TPCK475M003P8000	TPCL226M004R5000	TPCR107M004R1000	TPCR226K010R1500	TPCR226M010R1500
TPCR476M006R1800	TPCL225M006R5000	TPCL225M010R5000	TPCL225M016R5000	TPCL106K006R4000
TPCL106M010R4000	TPCL106M010X40TX	TPCL475K010R5000	TPCR106K010A1800	TPCR106K010R1800
TPCR336K004R1500	TPCR476K003R1500	TPCL225K006R5000	TPCL225K010R5000	TPCL225K016R5000
TPCR336K010R1500	TPCR336M010R1500	TPCH106M010R2500	TPCK225M006Q8000	TPCK475M003Q8000
TPCL106M010X4000	TPCR106M016A1800	TPCR106K016F1800	TPCL226M004X5000	TPCR106K010X1800