

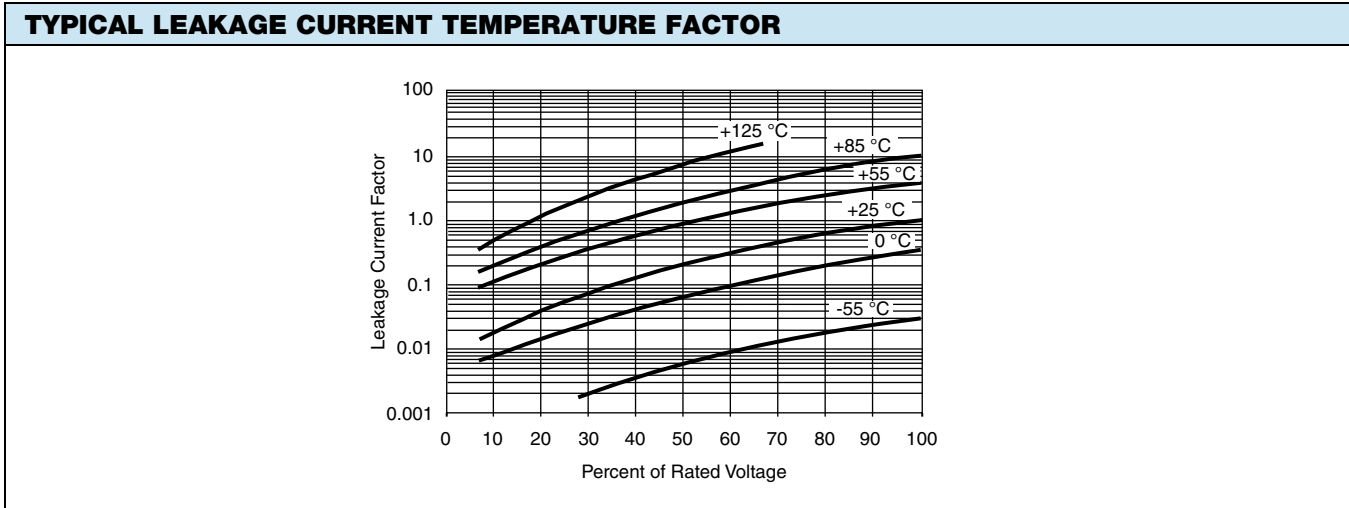


Conformal Coated Tantalum Capacitors

ELECTRICAL PERFORMANCE CHARACTERISTICS				
ITEM	PERFORMANCE CHARACTERISTICS			
Category temperature range	-55 °C to +85 °C (to +125 °C with voltage derating)			
Capacitance tolerance	± 20 %, ± 10 %, tested via bridge method, at 25 °C, 120 Hz			
Dissipation factor	Limits per Standard Ratings table. Tested via bridge method, at 25 °C, 120 Hz			
ESR	Limits per Standard Ratings table. Tested via bridge method, at 25 °C, 100 kHz			
Leakage current	After application of rated voltage applied to capacitors for 5 min using a steady source of power with 1 kΩ resistor in series with the capacitor under test, leakage current at 25 °C is not more than 0.01 CV or 0.5 μA, whichever is greater. <i>Note that the leakage current varies with temperature and applied voltage. See graph below for the appropriate adjustment factor.</i>			
Capacitance change by temperature	For capacitance value ≤ 300 μF +12 % max. (at +125 °C) +10 % max. (at +85 °C) -10 % max. (at -55 °C)		For capacitance value > 300 μF +20 % max. (at +125 °C) +15 % max. (at +85 °C) -15 % max. (at -55 °C)	
Reverse voltage	Capacitors are capable of withstanding peak voltages in the reverse direction equal to: 10 % of the DC rating at +25 °C 5 % of the DC rating at +85 °C 1 % of the DC rating at +125 °C Vishay does not recommend intentional or repetitive application of reverse voltage.			
Ripple current	For maximum ripple current values (at 25 °C) refer to relevant datasheet. If capacitors are to be used at temperatures above +25 °C, the permissible RMS ripple current (or voltage) shall be calculated using the derating factors: 1.0 at +25 °C 0.9 at +85 °C 0.4 at +125 °C			
Maximum operating and surge voltages vs. temperature	+85 °C		+125 °C	
	RATED VOLTAGE (V)	SURGE VOLTAGE (V)	CATEGORY VOLTAGE (V)	SURGE VOLTAGE (V)
	2.0	2.7	1.3	1.7
	4.0	5.2	2.7	3.4
	6.3	8.0	4.0	5.0
	10	13	7.0	8.0
	15 / 16	20	10	12
	20	26	13	16
	25	32	17	20
	35	46	23	28
	40	52	26	31
	50	65	33	40
	50 ⁽¹⁾	60	33	40
	63 ⁽²⁾	75	42	50
75 ⁽²⁾	75	50	50	
Recommended voltage derating guidelines (below 85 °C)	VOLTAGE RAIL		CAPACITOR VOLTAGE RATING	
	≤ 3.3		6.3	
	5		10	
	10		20	
	12		25	
	15		35	
	≥ 24		50 or series configuration	
	28		63 or series configuration	
≥ 32		75 or series configuration		

Notes

- All information presented in this document reflects typical performance characteristics
- For more information about recommended voltage derating see: www.vishay.com/doc?40246
- (1) Capacitance value 15 μF and higher
- (2) For 597D only



Notes

- At +25 °C, the leakage current shall not exceed the value listed in the Standard Ratings table
- At +85 °C, the leakage current shall not exceed 10 times the value listed in the Standard Ratings table
- At +125 °C, the leakage current shall not exceed 12 times the value listed in the Standard Ratings table

ENVIRONMENTAL PERFORMANCE CHARACTERISTICS			
ITEM	CONDITION	POST TEST PERFORMANCE	
Surge voltage	Post application of surge voltage (as specified in the table above) in series with a 33 Ω resistor at the rate of 30 s ON, 30 s OFF, for 1000 successive test cycles at 85 °C MIL-PRF-55365	Capacitance change Dissipation factor Leakage current	Within ± 10 % of initial value Initial specified limit Initial specified limit
Life test at +85 °C	2000 h application of rated voltage at 85 °C MIL-STD-202, method 108	Capacitance change Dissipation factor Leakage current	Within ± 10 % of initial value Initial specified limit Shall not exceed 125 % of initial limit
Life test at +125 °C	1000 h application 2/3 of rated voltage at 125 °C MIL-STD-202, method 108	Capacitance change: Cap. ≤ 600 μF Cap. > 600 μF Dissipation factor Leakage current	Within ± 10 % of initial value Within ± 20 % of initial value Initial specified limit Shall not exceed 125 % of initial limit
Humidity test	At 40 °C / 90 % RH, 1000 h, no voltage applied MIL-STD-202, method 103	Capacitance change: Cap. ≤ 600 μF Cap. > 600 μF Dissipation factor Leakage current	Within ± 10 % of initial value Within ± 20 % of initial value Not to exceed 150 % of initial limit Shall not exceed 200 % of initial limit
Moisture resistance	MIL-STD-202, method 106, 20 cycles	Capacitance change: Cap. ≤ 600 μF Cap. > 600 μF Dissipation factor Leakage current	Within ± 15 % of initial value Within ± 20 % of initial value Shall not exceed 150 % of initial limit Shall not exceed 200 % of initial limit
Thermal shock	At -55 °C / +125 °C, for 5 cycles, 30 min at each temperature MIL-STD-202, method 107	Capacitance change: Cap. ≤ 600 μF Cap. > 600 μF Dissipation factor Leakage current	Within ± 10 % of initial value Within ± 20 % of initial value Initial specified limit Initial specified limit



MECHANICAL PERFORMANCE CHARACTERISTICS		
ITEM	CONDITION	POST TEST PERFORMANCE
Terminal strength / Shear force test	Apply a pressure load of 5 N for 10 s ± 1 s horizontally to the center of capacitor side body AEC-Q200-006	Capacitance change Within ± 10 % of initial value Dissipation factor Initial specified limit Leakage current Initial specified limit There shall be no mechanical or visual damage to capacitors post-conditioning.
Vibration	MIL-STD-202, method 204, condition D, 10 Hz to 2000 Hz, 20 g peak, 8 h, at rated voltage	Electrical measurements are not applicable, since the same parts are used for shock (specified pulse) test. There shall be no mechanical or visual damage to capacitors post-conditioning.
Shock (specified pulse)	MIL-STD-202, method 213, condition I, 100 g peak	Capacitance change: Cap. ≤ 600 µF Within ± 10 % of initial value Cap. > 600 µF Within ± 20 % of initial value Dissipation factor Initial specified limit Leakage current Initial specified limit There shall be no mechanical or visual damage to capacitors post-conditioning.
Resistance to solder heat	MIL-STD-202, method 210, condition J (SnPb terminations) and K (lead (Pb)-free terminations), one heat cycle	Capacitance change Within ± 10 % of initial value Dissipation factor Initial specified limit Leakage current Initial specified limit
Solderability	EIA / IPC / JEDEC J-STD-002 Test B (SnPb) and B1 (lead (Pb)-free). Preconditioning per category C. Capacitors with SnPb and lead (Pb)-free terminations are backward and forward compatible. Does not apply to gold terminations.	Solder coating of all capacitors shall meet specified requirements. There shall be no mechanical or visual damage to capacitors post-conditioning.
Flammability	Encapsulation materials meet UL 94 V-0 with an oxygen index of 32 %	