

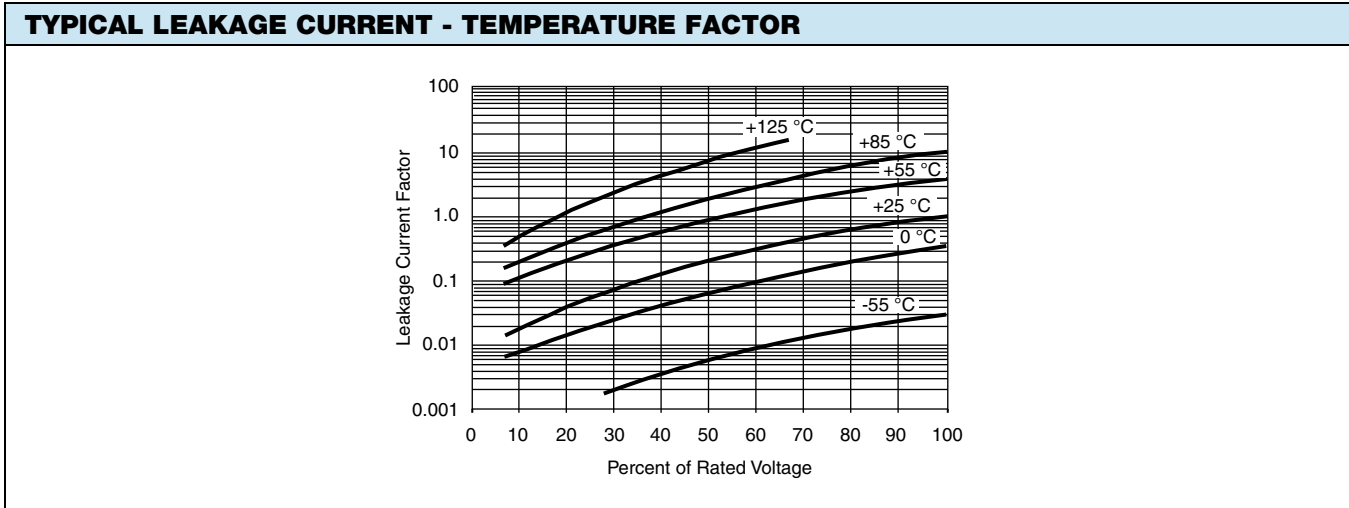


## Solid Tantalum Chip Capacitors MIL-PRF-55365 Qualified and DLA Approved

<b>ELECTRICAL PERFORMANCE CHARACTERISTICS</b>			
<b>ITEM</b>	<b>PERFORMANCE CHARACTERISTICS</b>		
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	Limit per Standard Ratings table. Tested via bridge method, at 25 °C, 120 Hz		
ESR	Limit 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 described in Standard Ratings table of appropriate datasheet. <i>Note that the leakage current varies with temperature and applied voltage. See graph below for the appropriate adjustment factor.</i>		
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 calculation (at 25 °C) refer to "Guide to Application" part of product guide which is linked with relevant datasheet. If capacitors are to be used at temperatures above +25 °C, the permissible 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	<b>+85 °C</b>		<b>+125 °C</b>
	<b>RATED VOLTAGE (V)</b>	<b>SURGE VOLTAGE (V)</b>	<b>CATEGORY VOLTAGE (V)</b>
	4.0	5.3	2.7
	6.3	8.0	4.0
	10	13.3	6.7
	15 / 16	20	10
	20	26.7	13.3
	25	33.3	16.7
	35	46.7	23.3
Recommended voltage derating guidelines (below 85 °C)	<b>VOLTAGE RAIL (V)</b>		<b>CAPACITOR VOLTAGE RATING (V)</b>
	≤ 3.3		6.3
	5		10
	10		20
	12		25
	15		35
	24		50 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](http://www.vishay.com/doc?40246)



**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														
Moisture resistance	MIL-STD-202, method 106, 20 cycles	Capacitance change    Within ± 15 % of initial value Dissipation factor    Shall not exceed 150 % of initial limit Leakage current        Shall not exceed 200 % of initial limit  Visual examination: there shall be no evidence of harmful corrosion, mechanical damage, or obliteration of marking (if applicable)														
Stability at low and high temperatures	MIL-PRF-55365 <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Step</th> <th>Test Temperature (°C)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>+25 ± 3</td> </tr> <tr> <td>2</td> <td>-55 + 0 / - 6</td> </tr> <tr> <td>3</td> <td>+25 ± 3</td> </tr> <tr> <td>4</td> <td>+85 + 4 / - 0</td> </tr> <tr> <td>5</td> <td>+125 + 4 / - 0</td> </tr> <tr> <td>6</td> <td>+25 ± 3</td> </tr> </tbody> </table>	Step	Test Temperature (°C)	1	+25 ± 3	2	-55 + 0 / - 6	3	+25 ± 3	4	+85 + 4 / - 0	5	+125 + 4 / - 0	6	+25 ± 3	Delta cap limit at -55 °C is ± 10 % (20 % for CWR15) of initial value Delta cap limit at 85 °C is ± 10 % (15 % for CWR15) of initial value Delta cap limit at 125 °C is ± 15 % (20 % for CWR15) of initial value Delta cap at step 3 and final step 25 °C is ± 5 % (10 % for CWR15) of initial value DCL at 85 °C: 10 x initial specified value DCL at 125 °C: 12 x initial specified value DCL at 25 °C: initial specified value at rated voltage DF change: refer to performance specification sheet for applicable capacitor style
Step	Test Temperature (°C)															
1	+25 ± 3															
2	-55 + 0 / - 6															
3	+25 ± 3															
4	+85 + 4 / - 0															
5	+125 + 4 / - 0															
6	+25 ± 3															
Surge voltage	MIL-PRF-55365 1000 successive test cycles at 85 °C of applicable 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	Capacitance change    Within ± 5 % of initial value Dissipation factor    Initial specified limit Leakage current        Initial specified limit														
Life test at +85 °C	MIL-STD-202, method 108 2000 h application of rated voltage at 85 °C	Capacitance change    Within ± 5 % (10 % for CWR15) of initial value Dissipation factor    Initial specified limit Leakage current        Shall not exceed 200 % of initial limit  There shall be no evidence of harmful corrosion or obliteration of marking (if applicable), mechanical damage, intermittent shorts, or permanent shorts or opens														
Life test at +125 °C	MIL-STD-202, method 108 2000 h application 2/3 of rated voltage at 125 °C	Capacitance change    Within ± 5 % (10 % for CWR15) of initial value Dissipation factor    Initial specified limit Leakage current        Shall not exceed 200 % of initial limit  There shall be no evidence of harmful corrosion or obliteration of marking (if applicable), mechanical damage, intermittent shorts, or permanent shorts or opens														



MECHANICAL PERFORMANCE CHARACTERISTICS		
ITEM	CONDITION	POST TEST PERFORMANCE
Vibration	MIL-STD-202, method 204, condition D, 10 Hz to 2000 Hz, 20 g peak, in 2 directions, 4 hours in each, at rated voltage	Measurements during vibration: During the last cycle of each plane, electrical measurements shall be made to determine the intermittent open or short circuits. Intermittent contact and arcing shall also be determined. Measurements after vibration: not applicable Visual examination after test: there shall be no evidence of mechanical damage
Thermal shock (mounted)	MIL-STD-202, method 107 -65 °C / +125 °C, for 10 cycles, 30 min at each temperature	Capacitance change      Within ± 5 % of initial value Dissipation factor      Initial specified limit Leakage current          Initial specified limit Visual examination: there shall be no evidence of harmful corrosion, mechanical damage, or obliteration of marking (if applicable)
Resistance to soldering heat	MIL-STD-202, method 210, condition J (convection reflow, 235 °C ± 5 °C), one heat cycle	Capacitance change      Within ± 5 % of initial value Dissipation factor      Initial specified limit Leakage current          Initial specified limit Visual examination: there shall be no evidence of mechanical damage
Solderability	MIL-STD-202, method 208, ANSI/J-STD-002, test B (dip- and look, 245 °C ± 5 °C). Preconditioning per category C (steam aging, 8 hours). 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.
Resistance to solvents	MIL-STD-202, method 215	There shall be no mechanical or visual damage to capacitors post-conditioning. Body marking shall remain legible and shall not smear.
Flammability	Encapsulation materials meet UL 94 V-0 with an oxygen index of 32 %	