



Wet Tantalum Capacitors Military Styles CLR79, CLR81, CLR90, and CLR91

ELECTRICAL PERFORMANCE CHARACTERISTICS			
ITEM	PERFORMANCE CHARACTERISTICS		
Operating temperature range	-55 °C to +85 °C (to +125 °C with voltage derating)		
Capacitance tolerance	± 20 %, ± 10 %, at 120 Hz, at +25 °C		
Capacitance change by temperature	Limit per Standard Ratings table		
ESR	For CLR90 and CLR91: limit per Standard Ratings table, at +25 °C, 120 Hz For CLR79 and CLR81: refer to M39006/22		
Impedance	Limit per Standard Ratings table, at -55 °C, 120 Hz		
DCL (leakage current)	Limit per Standard Ratings table		
AC ripple current	Limit per Standard Ratings table, at +85 °C and 40 kHz		
Reverse voltage	Reverse voltage rating at +85 °C is 3 V _{DC} and at +125 °C is 2 V _{DC}		
Maximum operating voltage	Rated (+85 °C) V _{DC}	Derated (+125 °C) V _{DC}	Surge (+85 °C) V _{DC}
	6	4	6.9
	8	5	9.2
	10	7	11.5
	15	10	17.2
	25	15	28.8
	30	20	34.5
	50	30	57.5
	60	40	69.0
	75	50	86.2
	100	65	115.0
125	85	144.0	
Surge voltage	The DC surge voltage is the maximum voltage to which the capacitor can be subjected under any conditions including transients and peak ripple at the highest line voltage. The DC surge voltage is 115 % of rated DC voltage		

PERFORMANCE CHARACTERISTICS		
ITEM	CONDITION	POST TEST PERFORMANCE
Surge voltage	85 °C 1000 successive test cycles at the applicable DC surge voltage specified in series with a 1 kΩ resistor at the rate of 30 s ON, 5.5 min OFF	The capacitors shall meet the requirements of MIL-PRF-39006: DC leakage Not to exceed the specified value Capacitance change Within ± 5 % of initial measurement Dissipation factor Not to exceed the specified value There shall be no evidence of mechanical damage or leakage of electrolyte
Life testing	Method 108 of MIL-STD-202. Capacitors shall be capable of withstanding a 10 000 h life test at a temperature +85 °C at rated voltage	The capacitors shall meet the requirements of MIL-PRF-39006: DC leakage at 85 °C and 125 °C Not to exceed 125 % of the specified value DC leakage at 25 °C Not to exceed the specified value Capacitance change Within +10 %, -20 % of initial measurement Dissipation factor Not to exceed 200 % of the specified value Dielectric withstanding voltage 2000 V _{DC} , min. Insulation resistance 100 MΩ, min.
AC ripple life	As specified in MIL-PRF-39006: 2000 h, +85 °C	The capacitors shall meet the requirements of MIL-PRF-39006: DC leakage Not to exceed the specified value Capacitance change Within ± 10 % of initial measurement Dissipation factor Not to exceed the specified value There shall be no damage, obliteration of marking, or leakage of electrolyte



ENVIRONMENTAL CHARACTERISTICS		
ITEM	CONDITION	POST TEST PERFORMANCE
Stability at low and high temperatures	As specified in MIL-PRF-39006	The capacitors shall meet the requirements of MIL-PRF-39006
Moisture resistance	Method 106 of MIL-STD-202	The capacitors shall meet the requirements of MIL-PRF-39006: DC leakage Not to exceed 125 % of +25 °C specified value Capacitance change Within ± 8 % of initial measurement Dissipation factor Not to exceed 115 % of the specified value
Thermal shock	Method 107 of MIL-STD-202, condition A (with step 3 at +125 °C) Number of cycles: 300 cycles for qualification and group C, subgroup 7; 30 cycles for group B and group C, subgroup 8	The capacitors shall meet the requirements of MIL-PRF-39006: DC leakage Not to exceed 200 % of +25 °C specified value for qualification and group C DC leakage Not to exceed 125 % of +25 °C specified value for group B Capacitance change Within ± 5 % of initial measurement Dissipation factor Not to exceed 115 % of the specified value
Salt atmosphere (corrosion)	Method 101 of MIL-STD-202, condition B (48 h)	There shall be no harmful corrosion, and the finish shall protect at least 90 % of any exposed metal surface of the capacitor. There shall be no unwrapping of, or mechanical damage to, the insulating sleeving, when applicable. Marking shall remain legible
Low temperature storage	Method 502 of MIL-STD-810, Storage temperature: -62 °C +0 °C, -3 °C. Exposure time: 72 h followed by a 1 h exposure at +125 °C, +7 °C, -0 °C within 24 h after low temperature storage	The capacitors shall meet the requirements of MIL-PRF-39006: DC leakage Not to exceed the specified value Capacitance change Within ± 5 % of initial measurement Dissipation factor Not to exceed the specified value There shall be no evidence of leakage of electrolyte
Seal	Method 112 of MIL-STD-202, conditions A or D, and C	When the capacitors are tested as specified in MIL-PRF-39006, there shall be no evidence of leakage.
Barometric pressure (reduced)	Method 105 of MIL-STD-202, condition E (150 000 ft) (45 720.1 m)	There shall be no flashover, breakdown, or harmful deformation of the case, and mechanical damage, obliteration of marking, or leakage of electrolyte.

MECHANICAL PERFORMANCE CHARACTERISTICS		
ITEM	CONDITION	POST TEST PERFORMANCE
Shock (specified pulse)	Method 213 of MIL-STD-202, condition I (100 g's) or condition D (500 g's) for "H" designated units	The capacitors shall meet the requirements of MIL-PRF-39006
Vibration, high frequency	Method 204 of MIL-STD-202, condition D (20 g's) or condition H (80 g's) for "H" designated units	The capacitors shall meet the requirements of MIL-PRF-39006
Random vibration ("H" designated units only)	Method 214 of MIL-STD-202, condition II-K (53.79 g's).	The capacitors shall meet the requirements of MIL-PRF-39006: DC leakage Not to exceed 125 % of the specified value Capacitance change Within ± 5 % of initial measurement Dissipation factor Not to exceed 115 % of the specified value There shall be no evidence of harmful corrosion, mechanical damage, obliteration of marking, or leakage of electrolyte.
Solderability	Method 208 of MIL-STD-202	The capacitors shall meet the requirements of MIL-PRF-39006
Terminal strength	Pull test: method 211 of MIL-STD-202, condition A. Wire-lead bend: in accordance with MIL-PRF-39006	There shall be no loosening of or permanent damage to the terminals, terminal weld or solder, or seal.
Dielectric withstanding voltage	Method 301 of MIL-STD-202, 2000 V _{DC} min.	The capacitors shall meet the requirements of MIL-PRF-39006
Insulation resistance	Method 302 of MIL-STD-202, condition B (500 V _{DC} ± 10 %)	The insulation resistance shall be not less than 100 MΩ
Resistance to solvent	Method 215 of MIL-STD-202	There shall be no mechanical or visual damage to capacitors post-conditioning. Marking shall remain legible, no degradation of the can material.
Resistance to soldering heat	Method 210 of MIL-STD-202, condition C	The capacitors shall meet the requirements of MIL-PRF-39006: DC leakage Not to exceed the specified value Capacitance change Within ± 5 % of initial measurement Dissipation factor Not to exceed the specified value There shall be no evidence of mechanical damage