



FINAL REVIEW

HERMETICALLY SEALED LOW ESR TANTALUM CAPACITOR

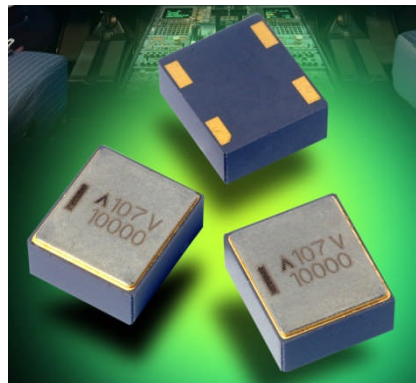
ESTEC/CONTRACT NO. 22845/09/NL/CBI

PRESENTED BY TOMAS ZEDNICEK
11/15/2012

HERMETIC PACKAGES OUTLOOK

- hermetic package design removes humidity related limitations
 - long term reliability of polymer capacitor up to
 - : 125°C/0.66U_R/10.000hrs
 - : 85°C/85% RH/1.000hrs
- the low ESR feature allows higher power rating capability of the capacitor, more efficient filtering and faster response in power supplies applications

TCH SERIES



■ Design and Development Milestones

- the project remained +6 months

Milestone Description	Key Deliverables	Scheduled Dates	Real Dates
ADVANCE: upon signature of the Contract by both parties	-	01/2010	01/2010
PROGRESS 1: upon completion and acceptance of WP1	mechanical samples followed by KD1 review	05/2010	08/2010
PROGRESS 2: upon completion and acceptance of WP2	presentation of first engineering samples followed by KD3 review	07/2011	01/2012
PROGRESS 3: upon completion and acceptance of WP3	testing review report of qualification samples followed by KD5 review	12/2011	09/2012
FINAL: Upon the Agency's acceptance of all deliverable items due under the Contract and the Contractor's fulfilment of all other contractual obligations: including performance of the Final Presentation	final report, technical datapackage, executive summary, abstract, photographic documentation, hardware samples	05/2012	11/2012
TOTAL		28 months	34 months

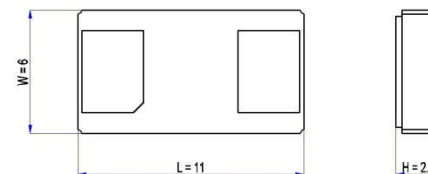
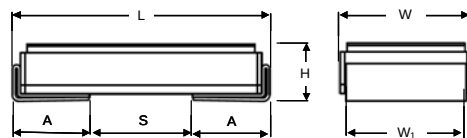
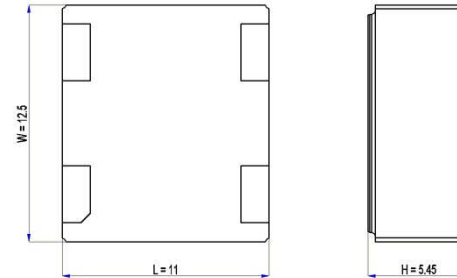
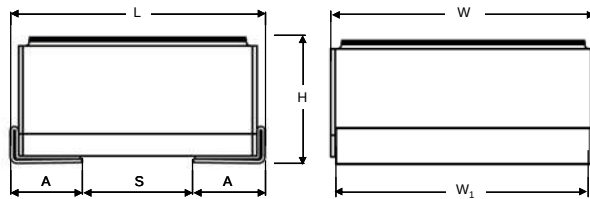


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■ Specification

— Case Size

Code	Type	L	W	H	W1	A	S
9 (CTC-21D)	J-lead	11.8	12.5	5.8	10.5	1.9	8
9 (CTC-21D)	Standard	11	12.5	5.45	10.5	1.5	8
I	J-lead	11.8	6	2.6	5.5	3.5	4.6
I	Standard	11	6	2.4	4	3	4.6



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■ Specification

– Rated Voltage

Code Voltage	16	20	25	35	50	63	75
Rated Voltage (VDC)	16.0	20.0	25.0	35.0	50.0	63.0	75.0
Surge Voltage (V) @ 85°C	20.8	26.0	32.5	45.5	65.0	81.9	97.5
Category Voltage (V)@125°C	10.6	13.2	16.5	23.1	33.0	41.6	49.5
Surge Voltage (V) @ 125°C	12.8	16	20	28	40	50.4	60

– Operating Temperatures

Operating temperature range	- 55°C / +125°C
Maximum operating temperature at rated voltage	+ 85°C



■ CV Capability

Capacitance		Rated voltage DC (VR) to 85°C								
μF	Code	10V	16V	20V	25V	35V	50V	63V	75V	100V
1,5	155									
2,2	225								I	
3,3	335						I	I	I	
4,7	475						I	I		
6,8	685						I			
10	106					I				
15	156			I	I	I				
22	226		I	I	I	I			9	
33	336		I	I	I			9	9	
47	476		I	I			9	9		
68	686		I	I			9			
100	107		I		9	9				
150	157			9	9	9				
220	227		9	9	9					
330	337		9	9						
470	477		9							
680	687		9							

*Codes under development

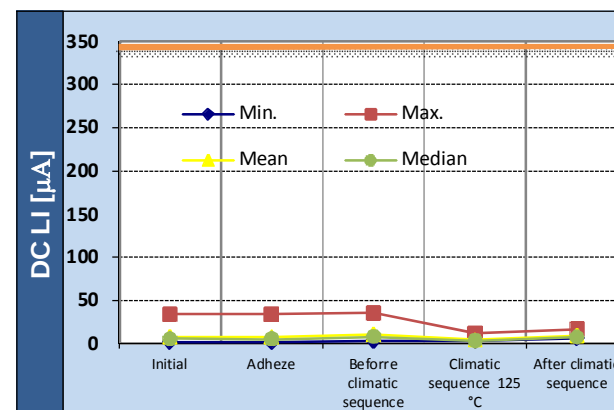
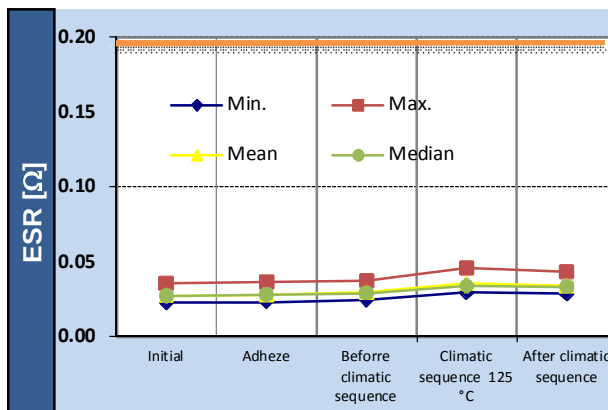
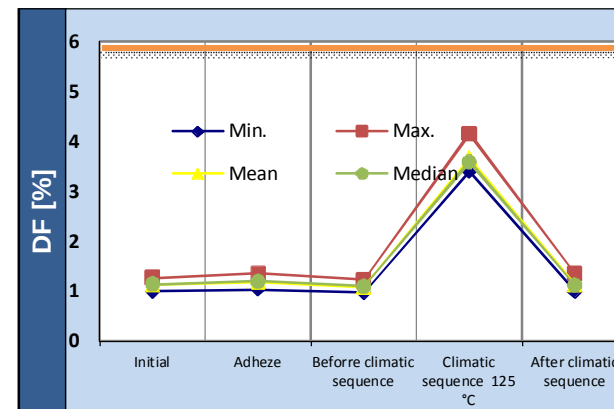
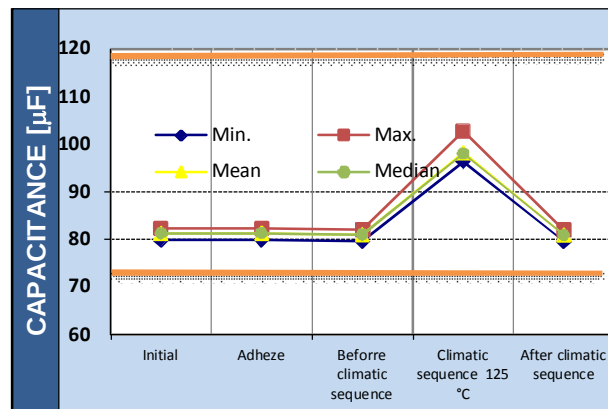
*Engineering samples



■ Performance Testing Results

- adhesion, permanence of marking, climatic sequence

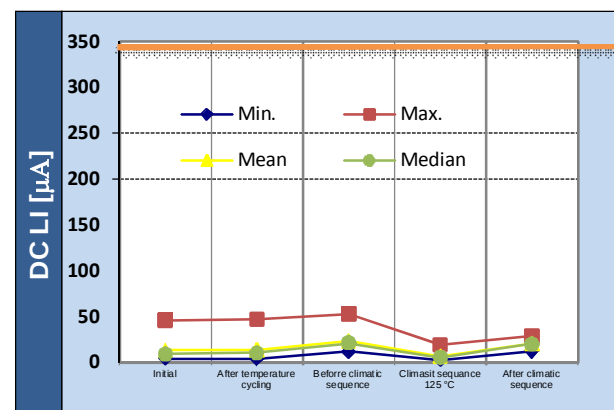
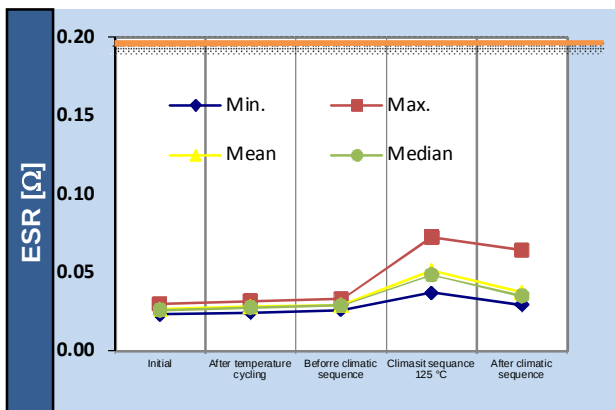
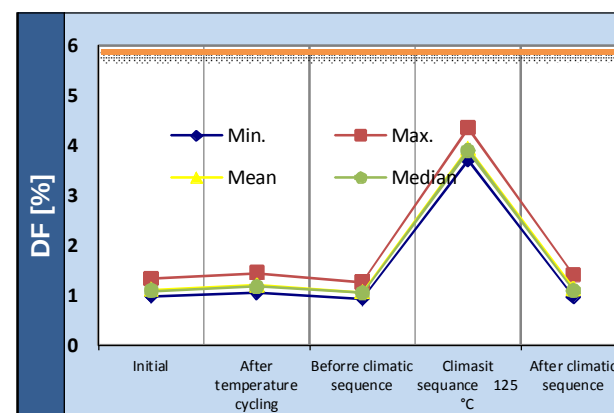
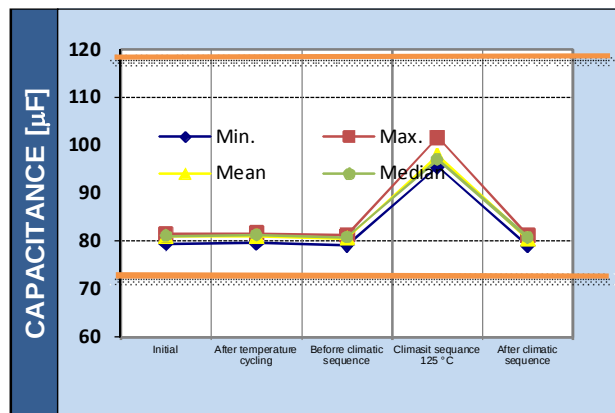
Statistics



■ Performance Testing Results

- rapid change of temperature, vibration, shock or bump, permanence of marking, climatic sequence

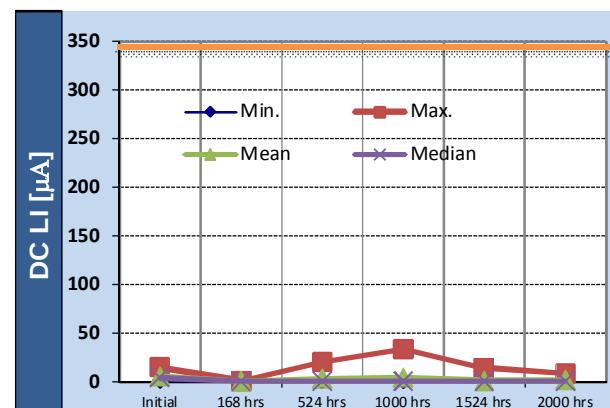
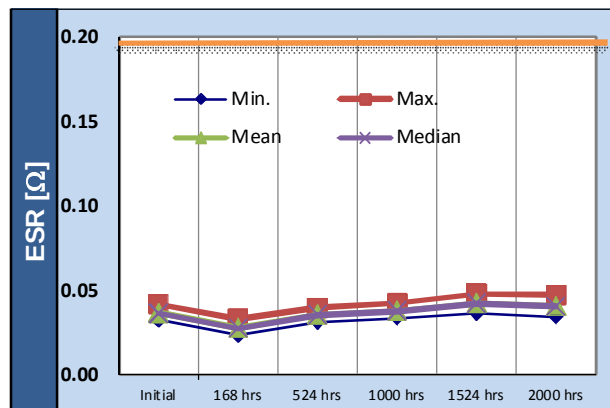
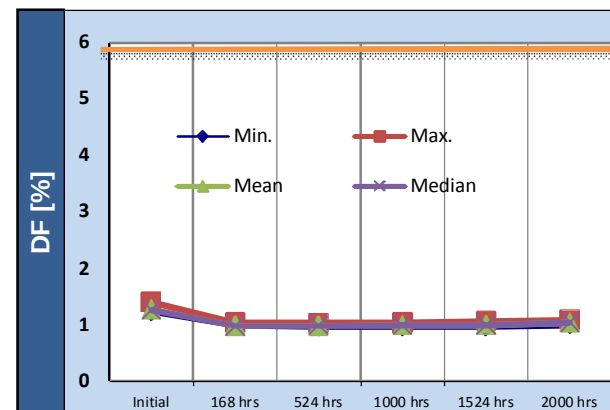
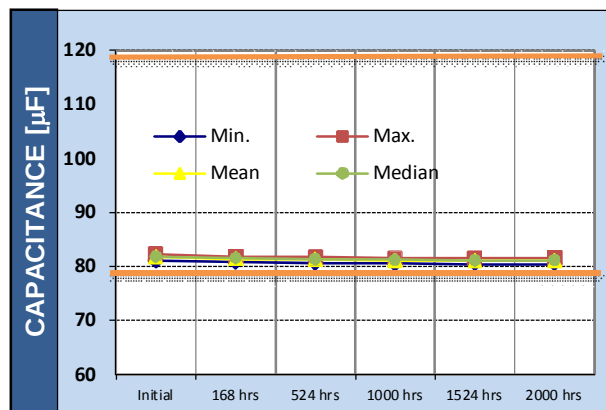
Statistics



■ Performance Testing Results

- 125°C endurance

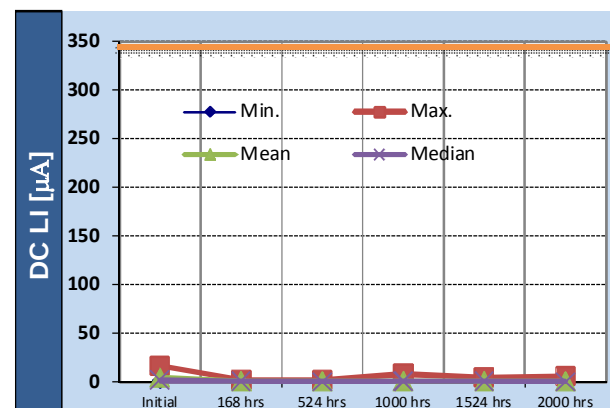
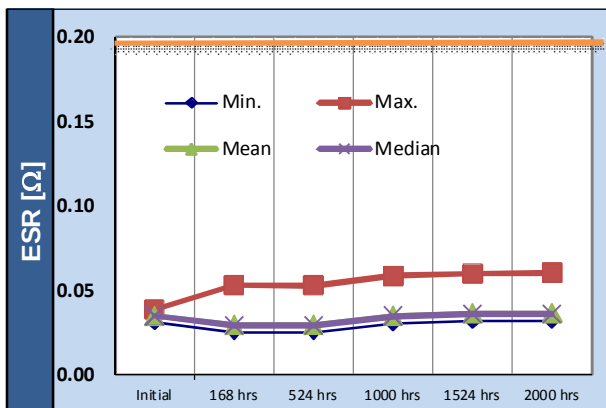
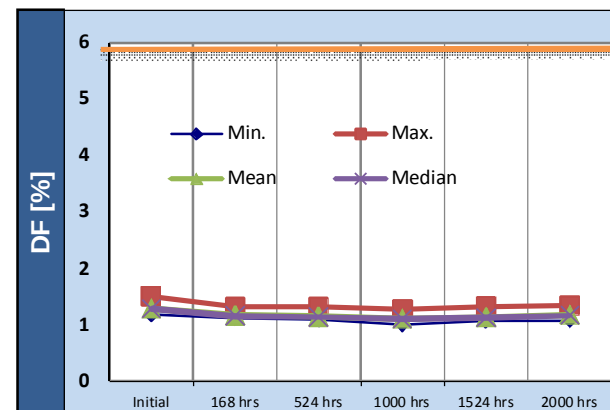
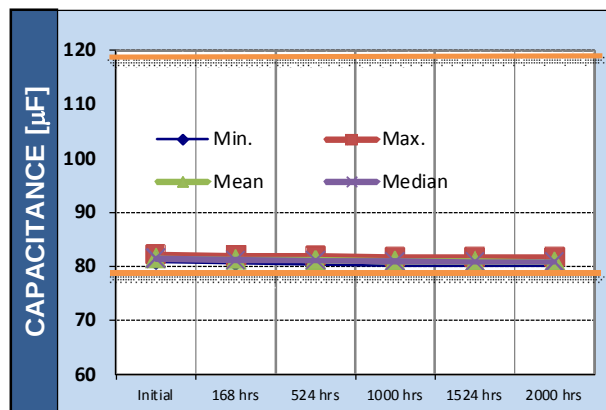
Statistics



■ Performance Testing Results

— 85°C endurance

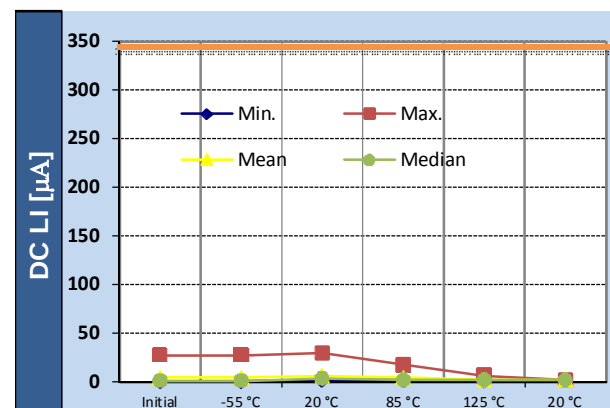
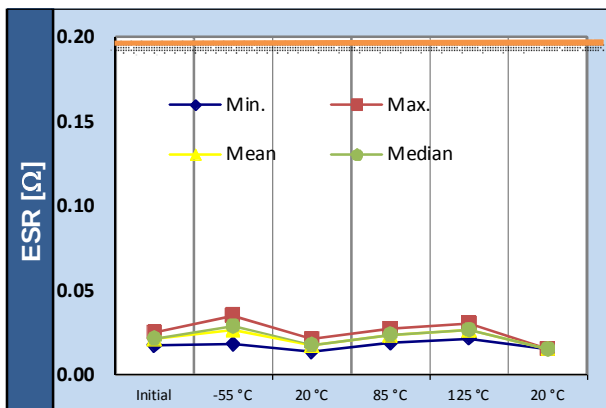
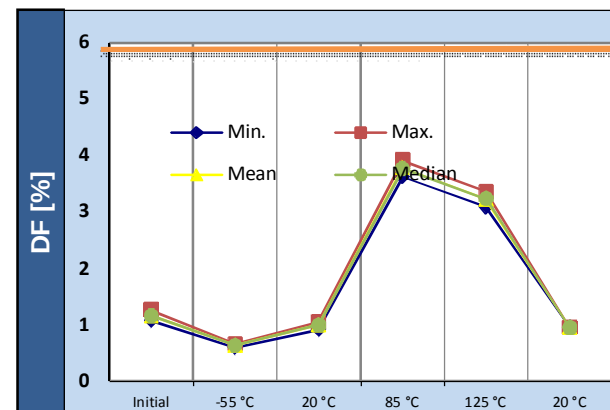
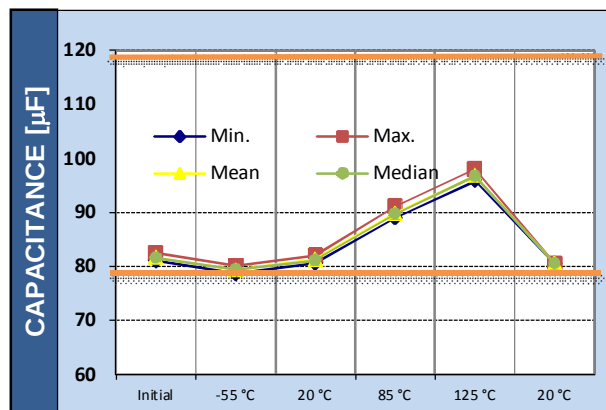
Statistics



■ Performance Testing Results

- electrical measurements at high and low temperature, electrical measurements at room temperature

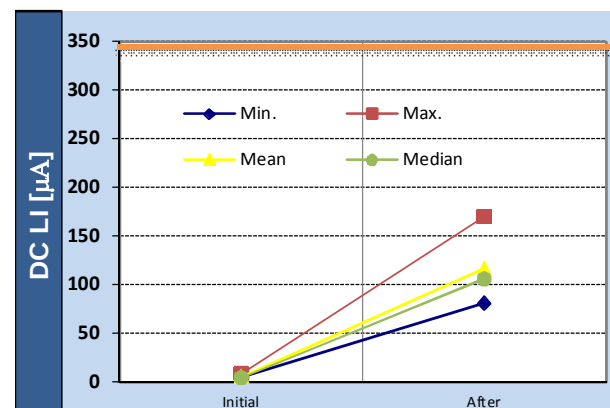
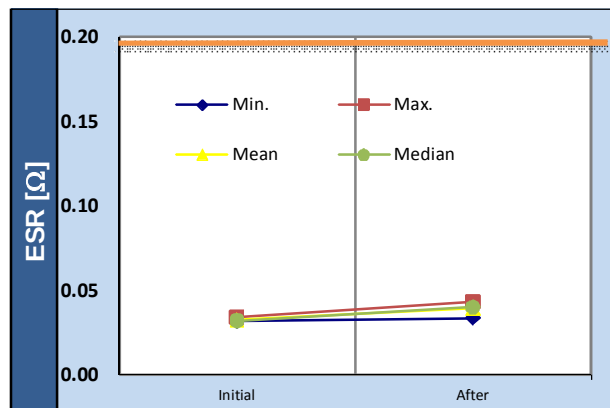
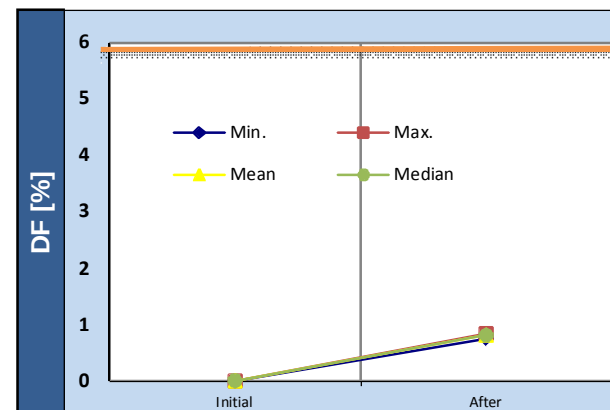
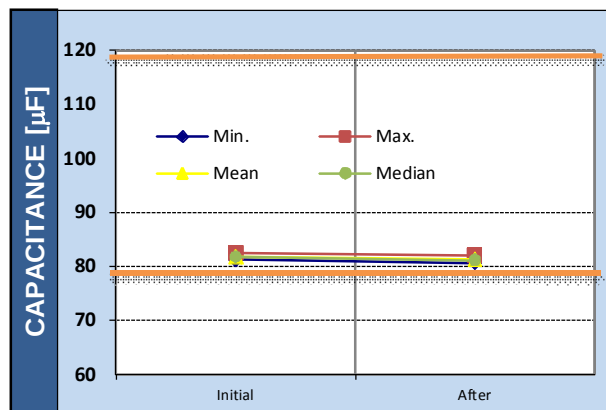
Statistics



■ Performance Testing Results

- rapid change of temperature

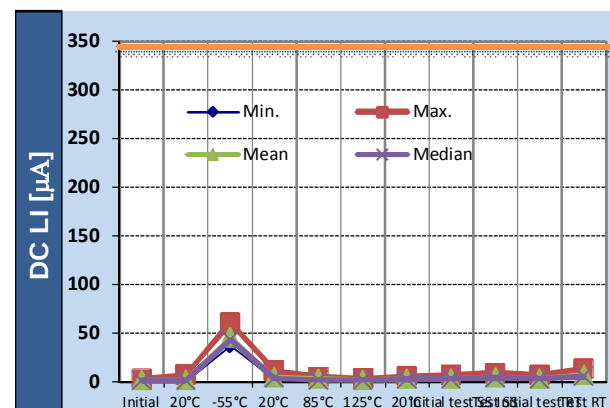
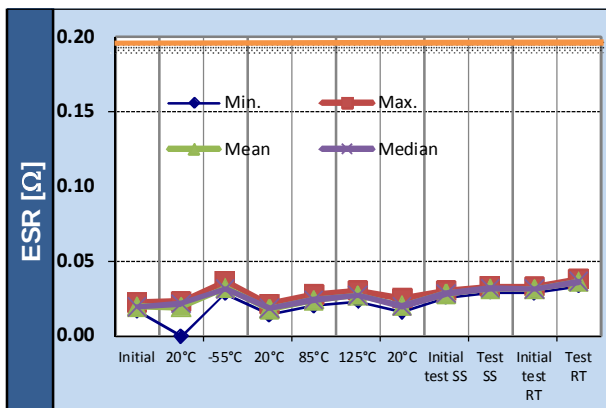
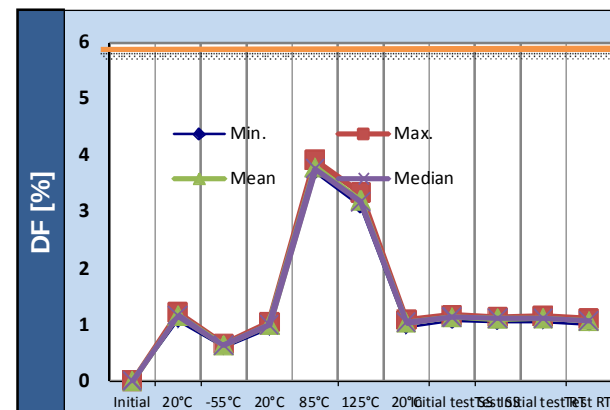
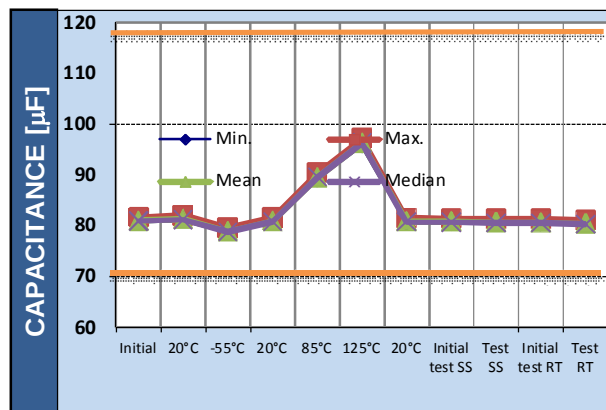
Statistics



■ Performance Testing Results

- electrical measurements at high and low temperature, surge voltage and damp heat steady state

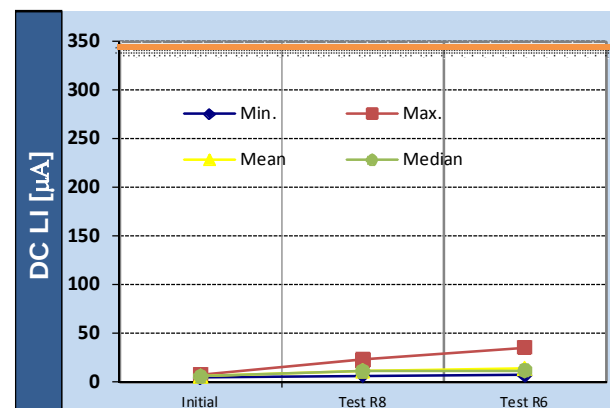
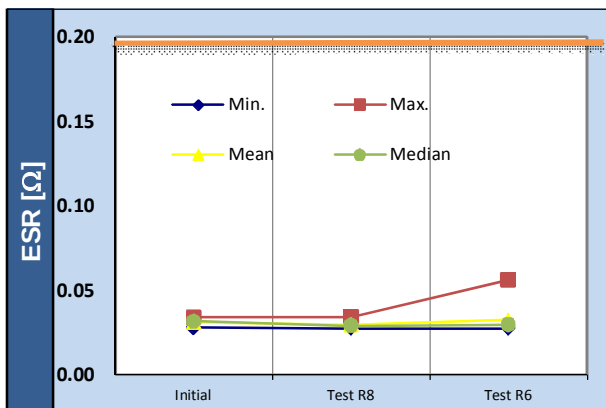
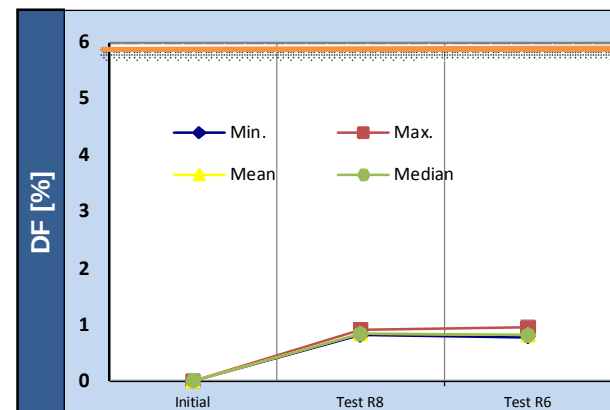
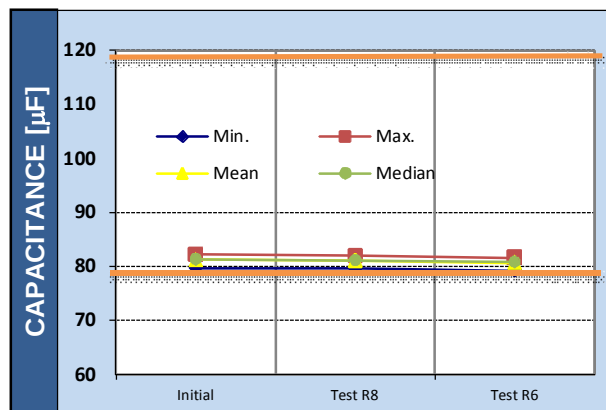
Statistics



■ Performance Testing Results

- rapid change of temperature, composite temperature/humidity cycling

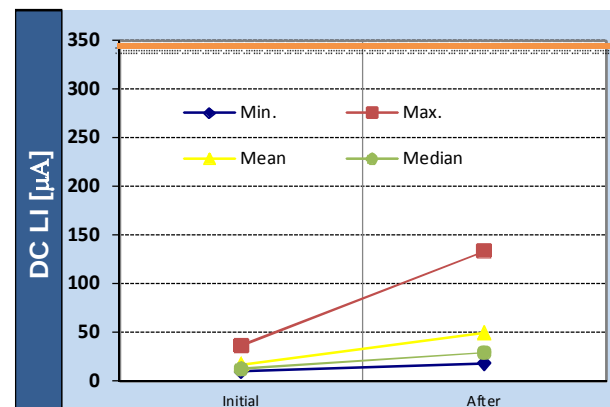
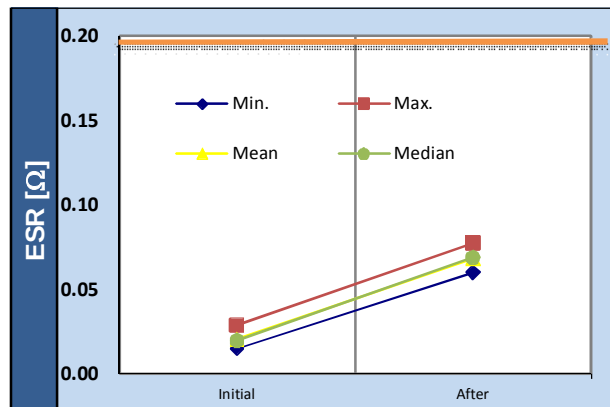
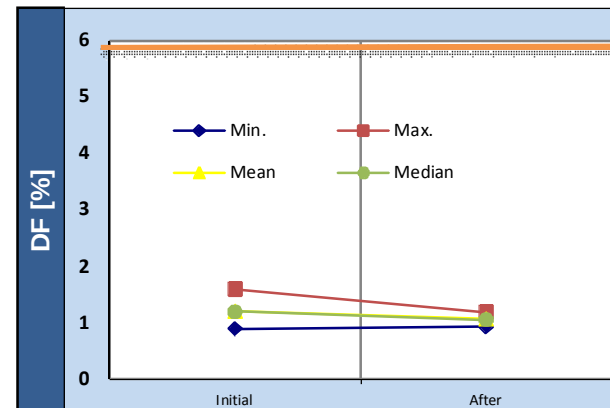
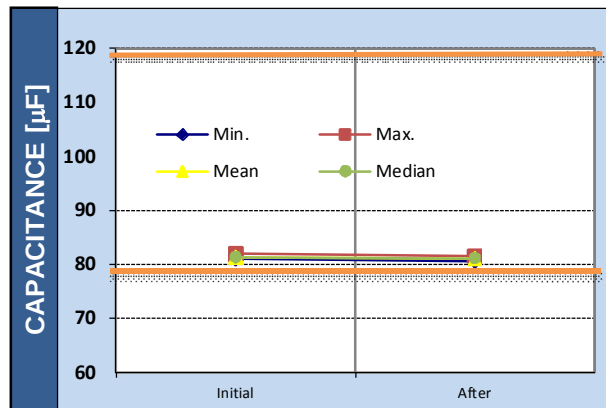
Statistics



■ Performance Testing Results

— 125°C vibration

Statistics



■ Reliability Tests

- ESCC 3012
- ESCC 5000
- vibration up to 125°C
- vibration up to 40g;

PASS

PASS

PASS

PASS

■ AVX Qualification

- 9/100 μ F/35V
- Annual Capacity 100k pcs max.

