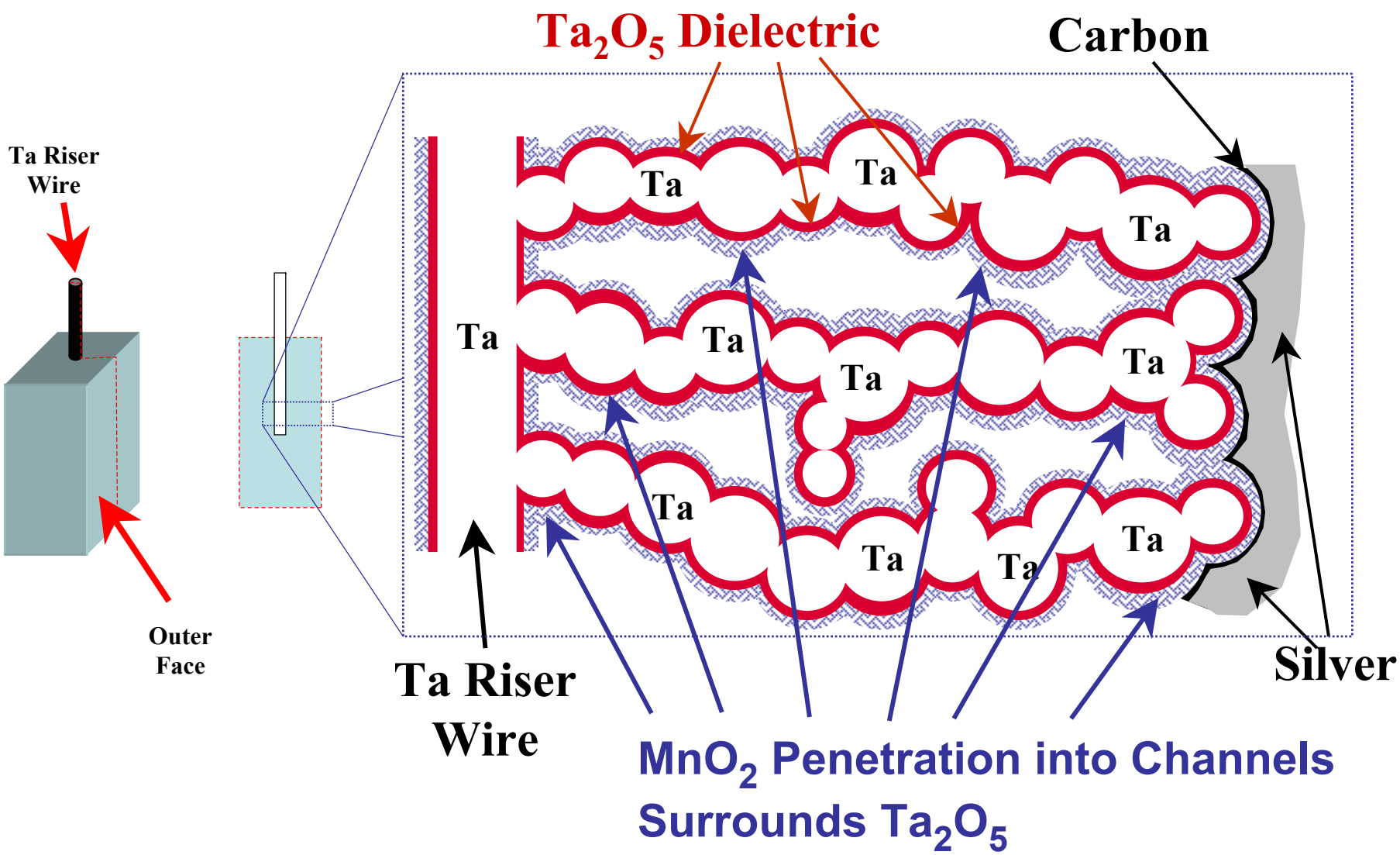
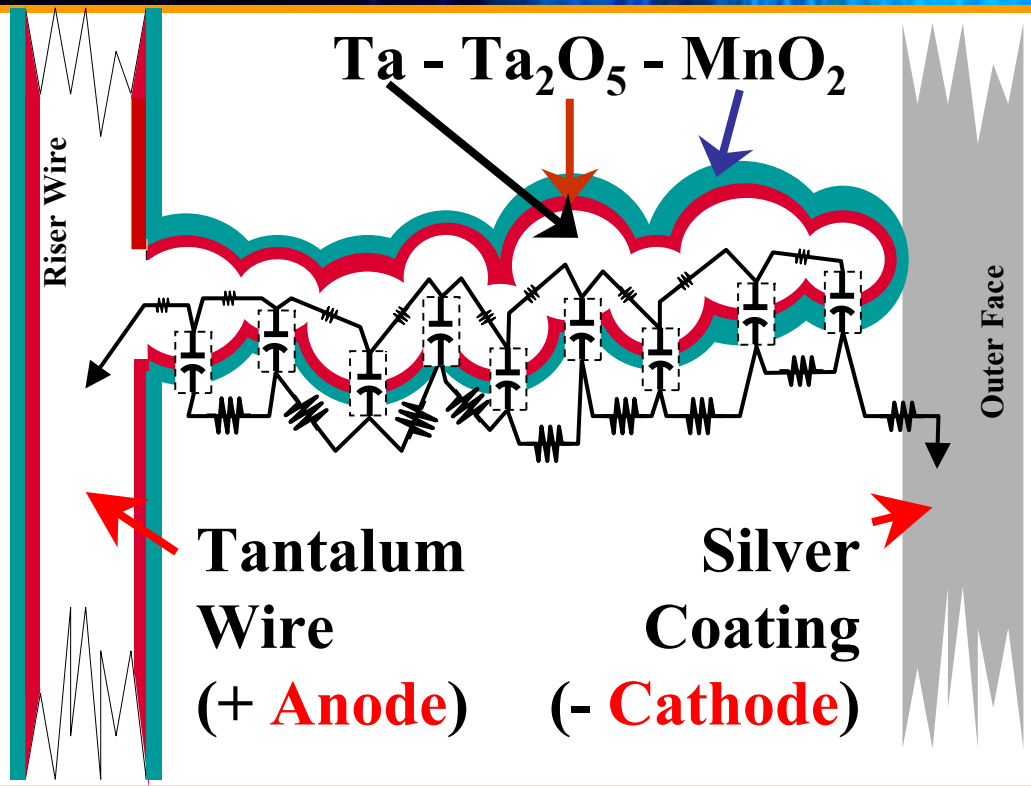
Benefits of Conductive Polymer as Cathode System in Tantalum Capacitors "KO" (KEMET Organic)

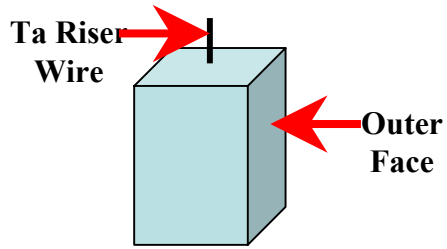
Tantalum Construction



Electrolytic RC-Ladder Structure



RC-Ladder Effects



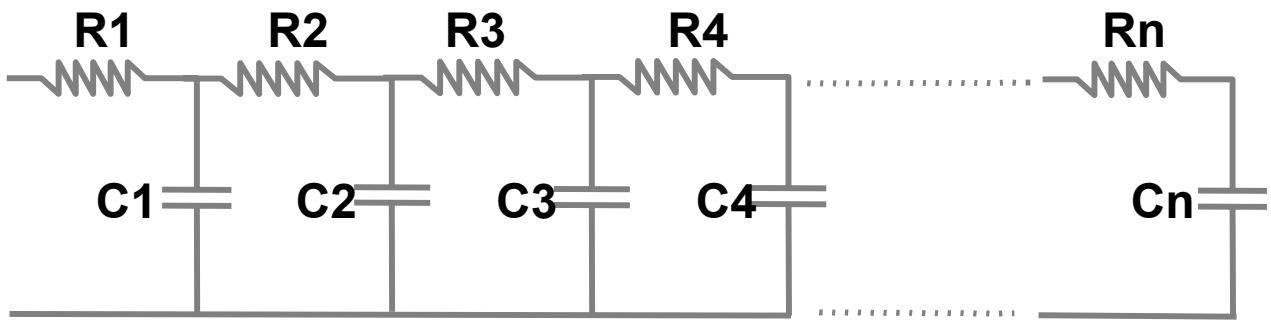
$tc1 = C1 \times R1$

$tc2 = C2 \times (R1+R2)$

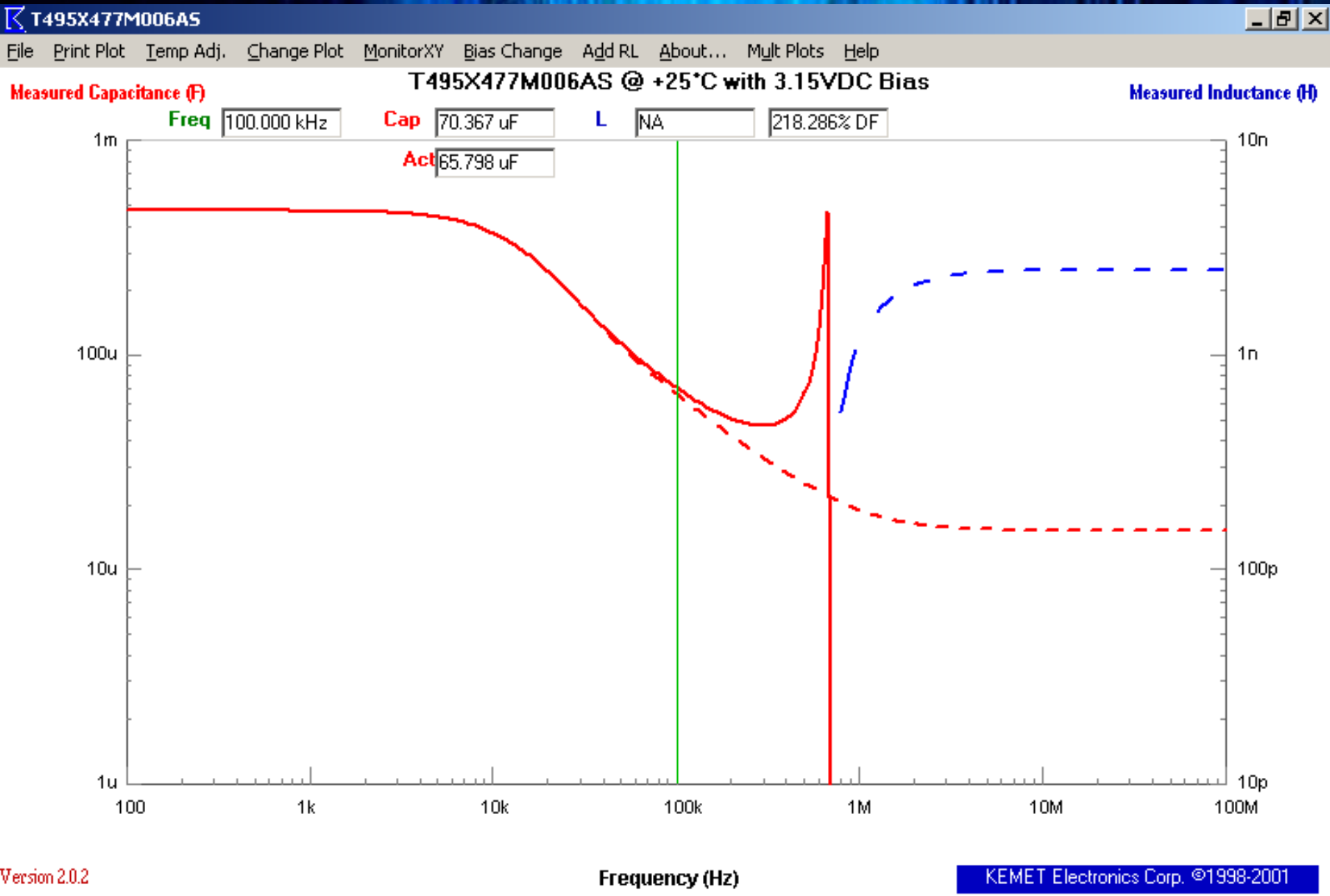
$tc3 = C3 \times (R1+R2+R3)$

$tcn = Cn \times (R1+R2+R3...+Rn)$

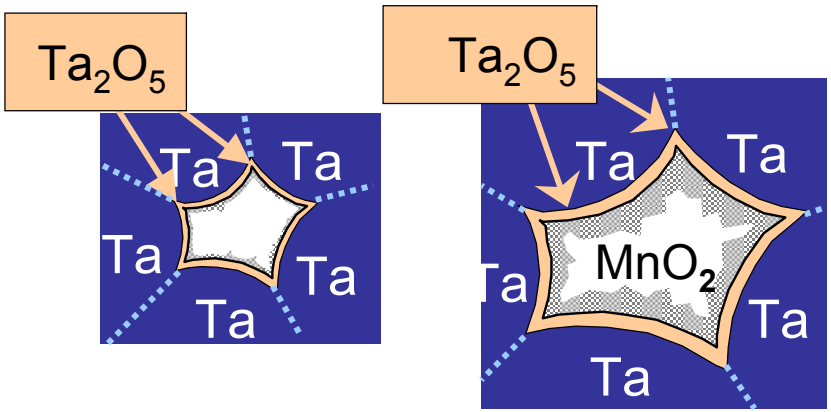
RC-Ladder effects are factored by both capacitance and resistance.



Electrolytic's Loss of Capacitance

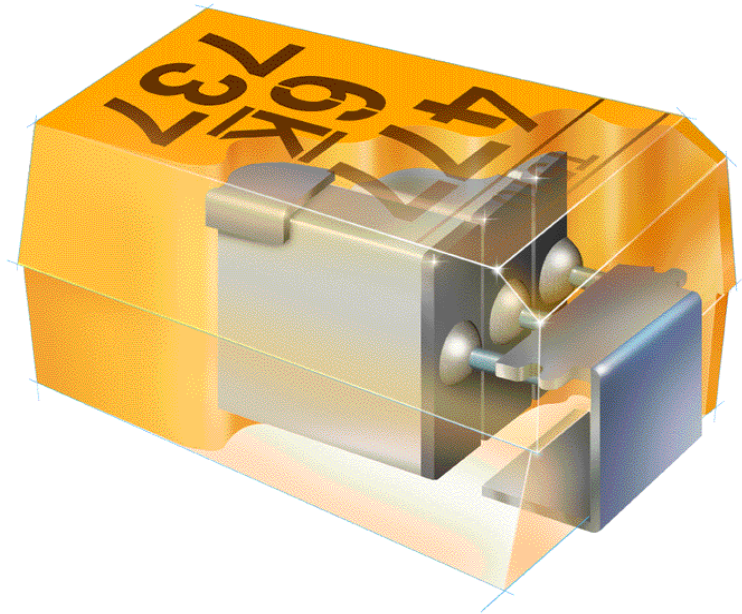


Lower Capacitance Loss with Frequency



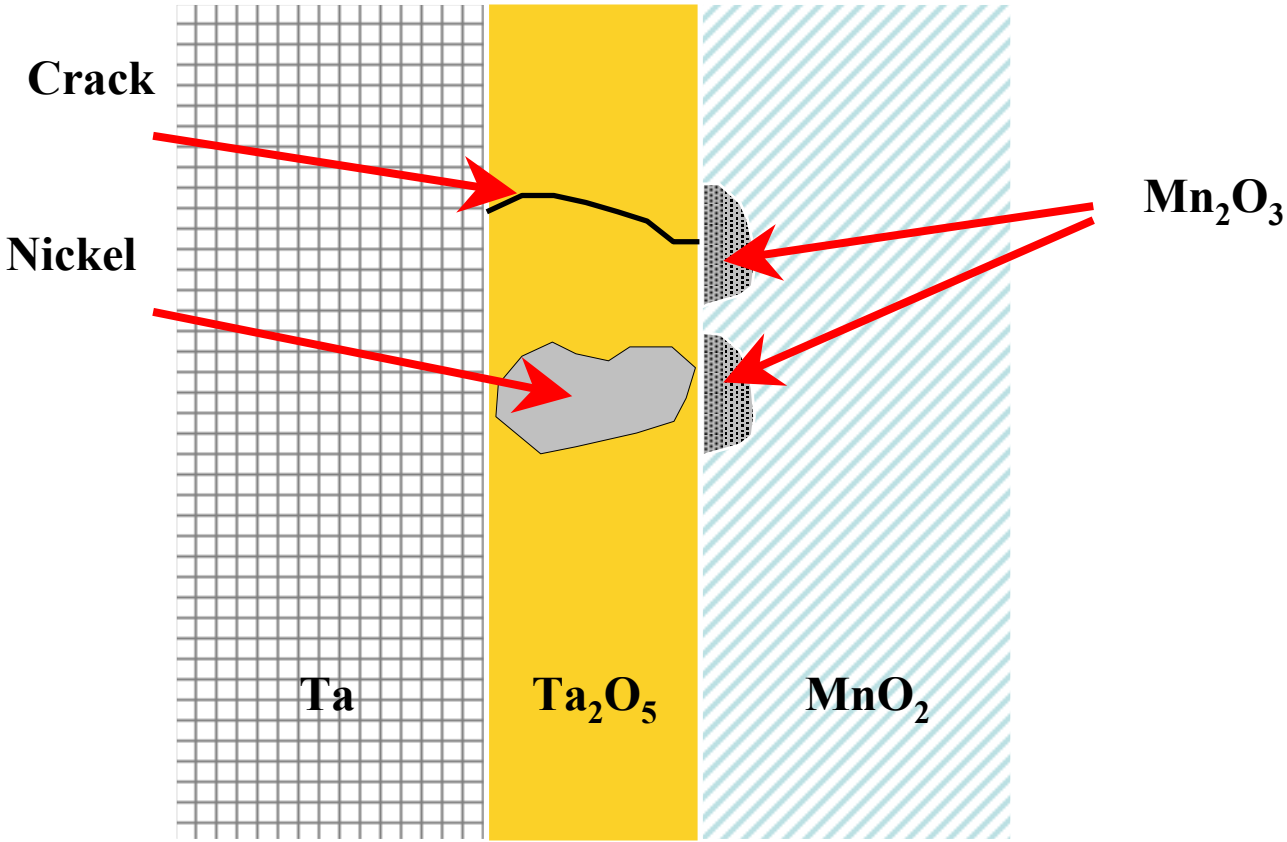
T495
Larger Pores
More MnO2
Lower ESR

T510
Multiple-pellets
Lower ESR

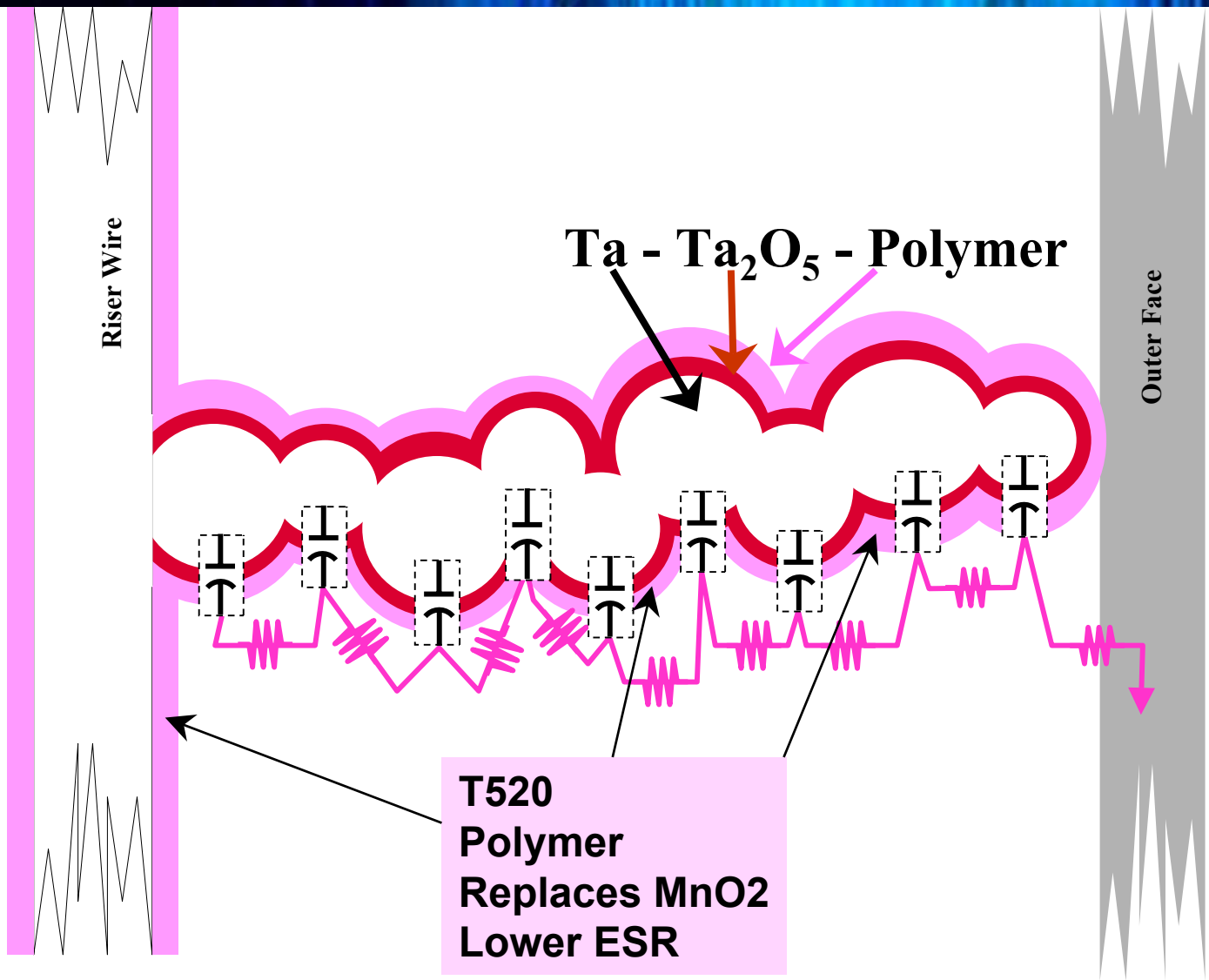


MnO_2 Self-Healing

Healing Effect of MnO_2 Layer

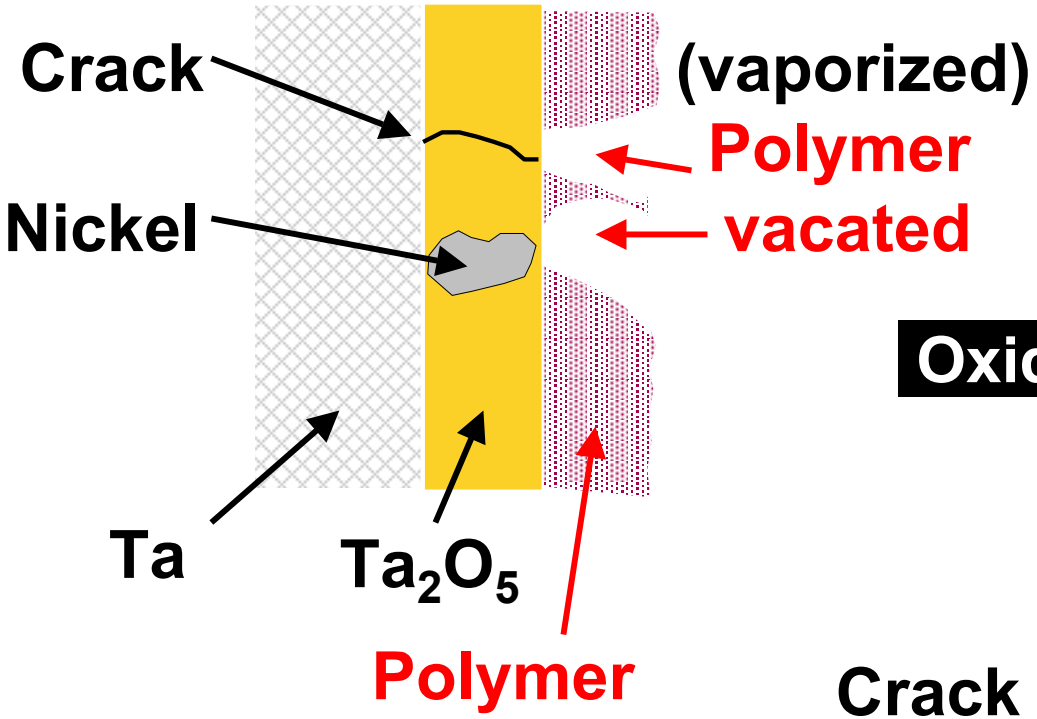


Conductive Polymer replacing MnO_2

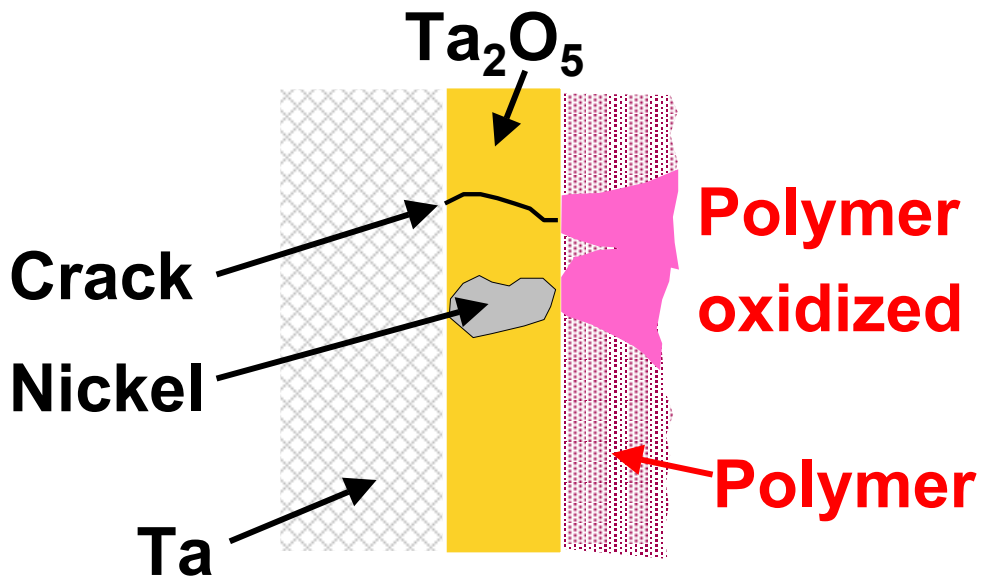


Polymer Self-Healing

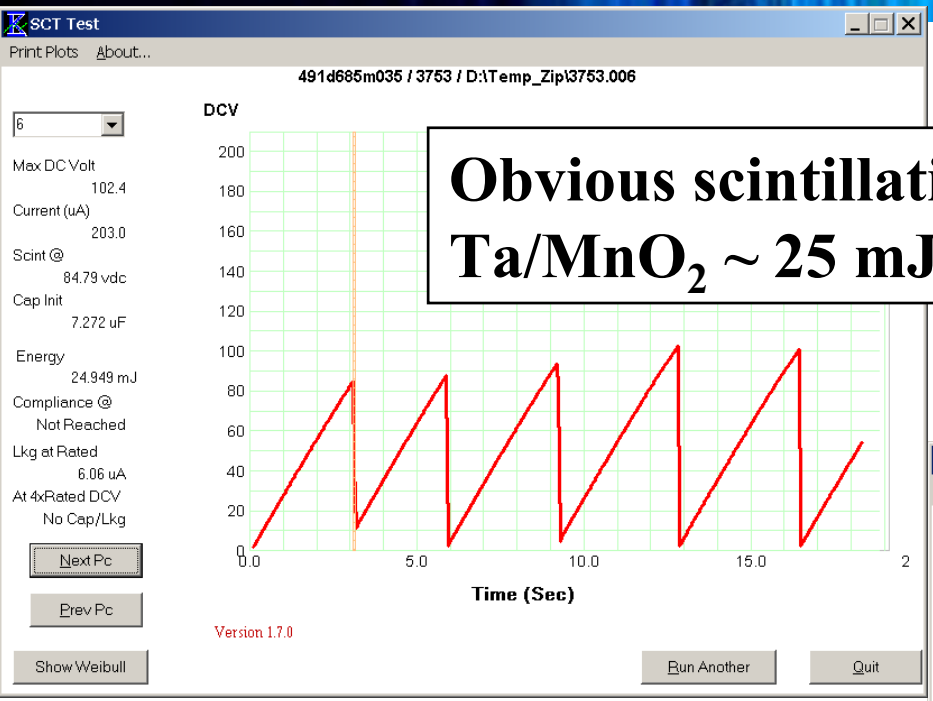
Evaporation of Conductive Polymer Layer



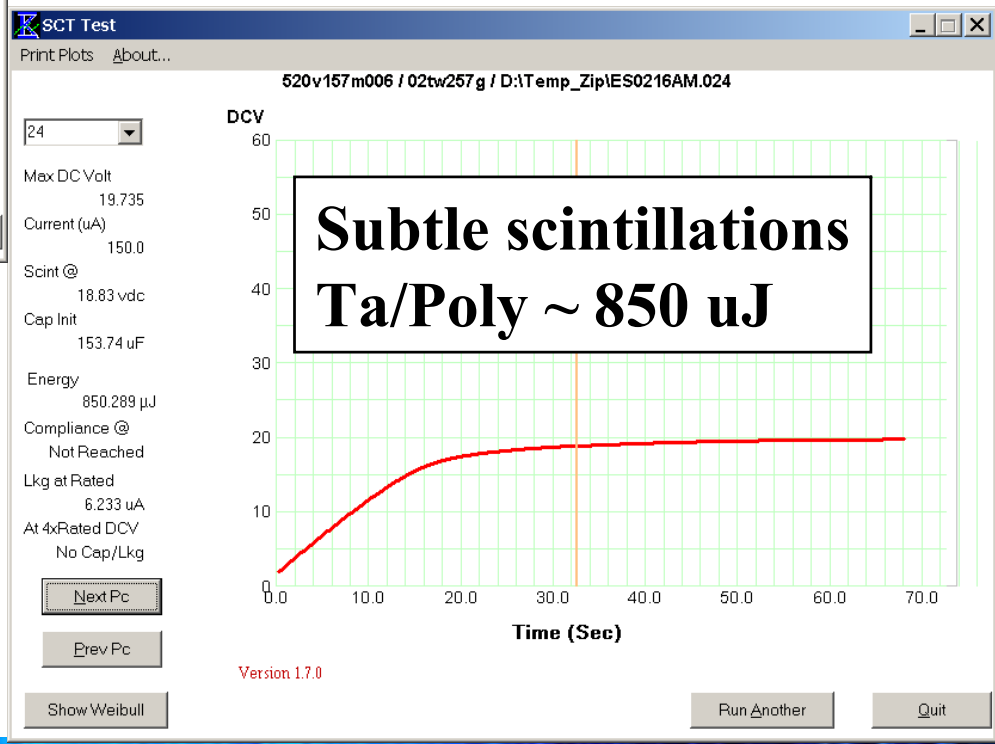
Oxidation of Polymer Layer



Scintillations (Captured Self-Healing)

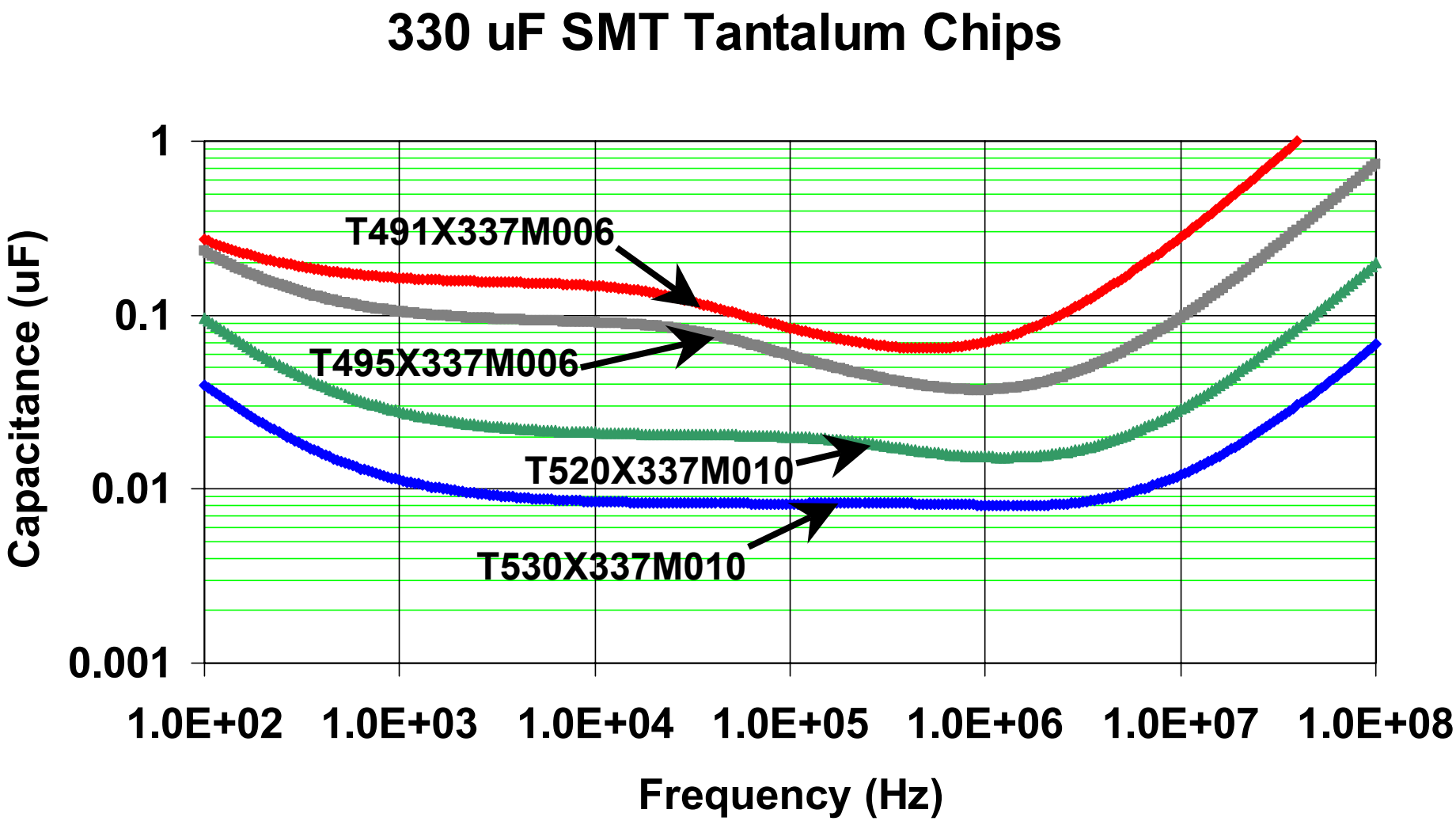


Obvious scintillations
Ta/MnO_2 ~ 25 mJ

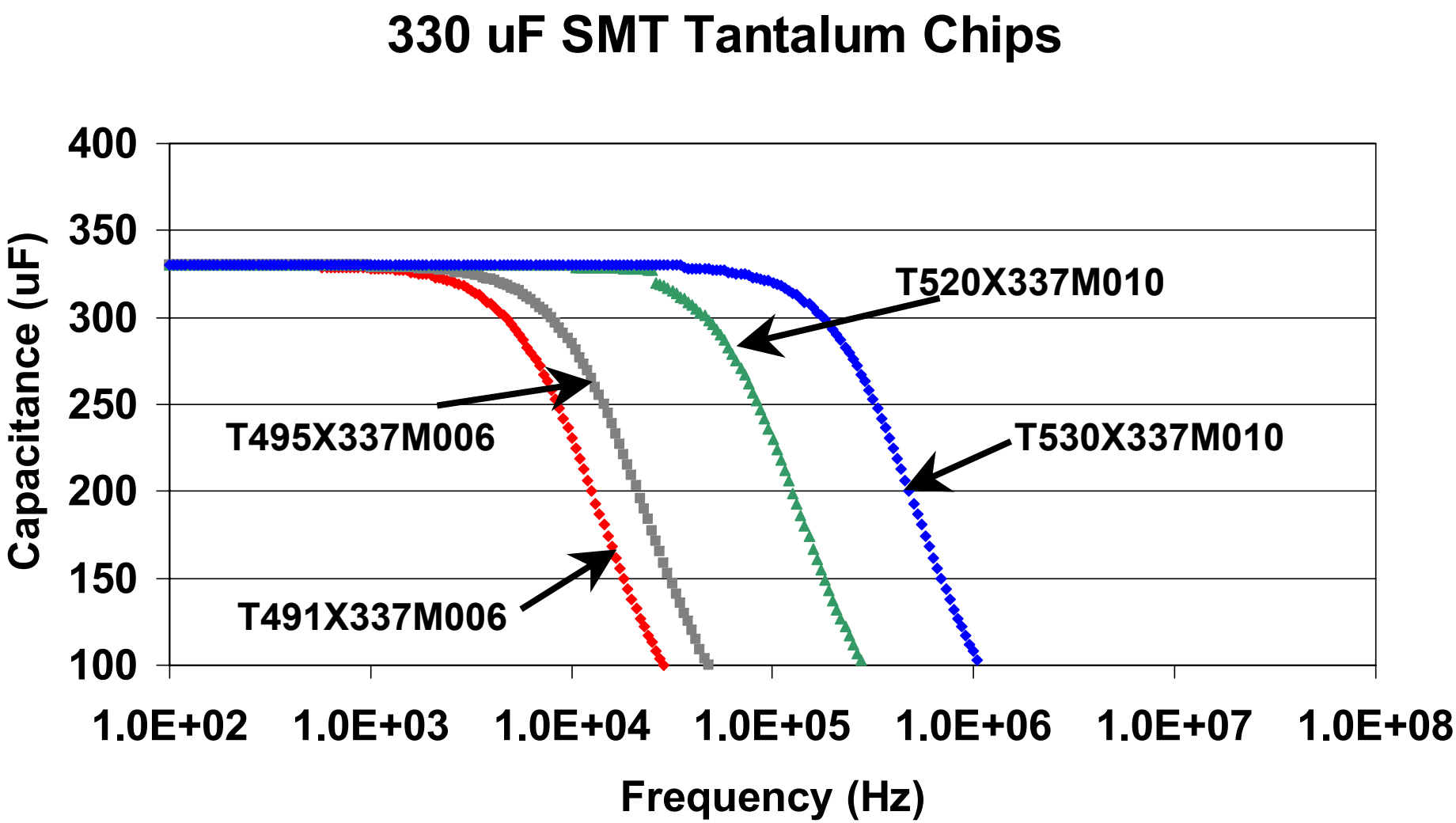


Subtle scintillations
Ta/Poly ~ 850 uJ

Improvements in Tantalum - ESR



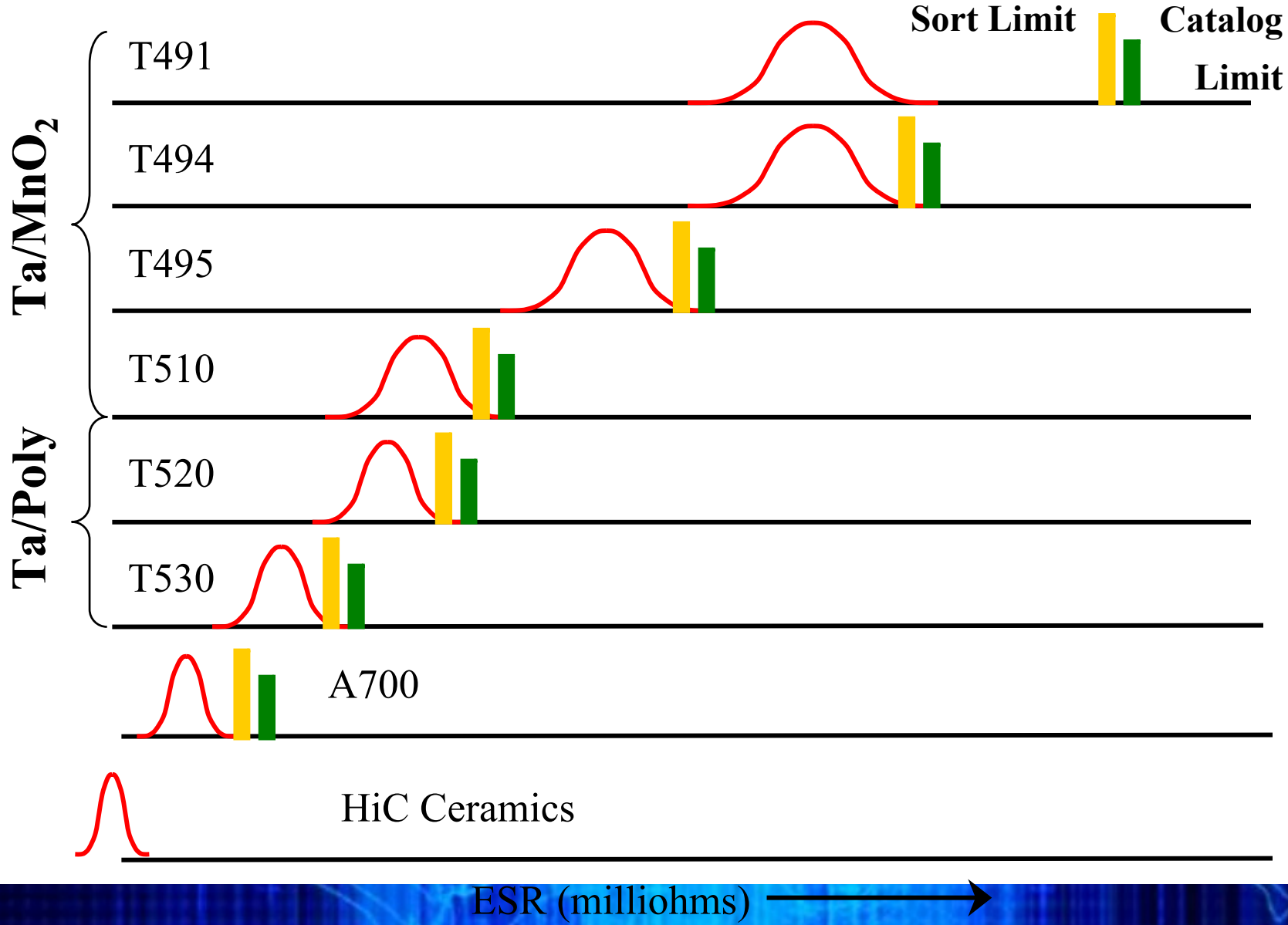
Improvements in Tantalum



Power-on Failure Test (SSST)

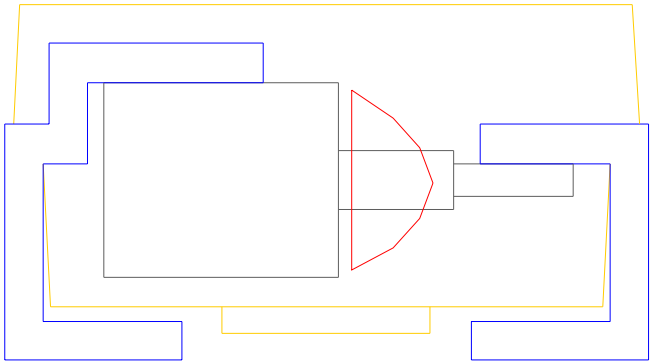
	MnO_2	Ta-Poly KO V_R>10	Ta-Poly KO V_R<=10
100 PPM FR % V_{Rated}	68%	126%	197%
@50% V_{Rated} FR(PPM)	9	0	0
@80% V_{Rated} FR(PPM)	458	4	1
@90% V_{Rated} FR(PPM)	1,700	12	2
@100% V_{Rated} FR(PPM)	6,310	35	8

ESR Distribution

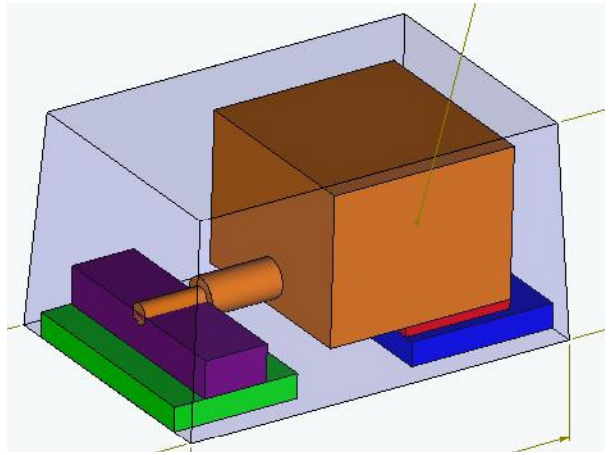


Small Case Improvements

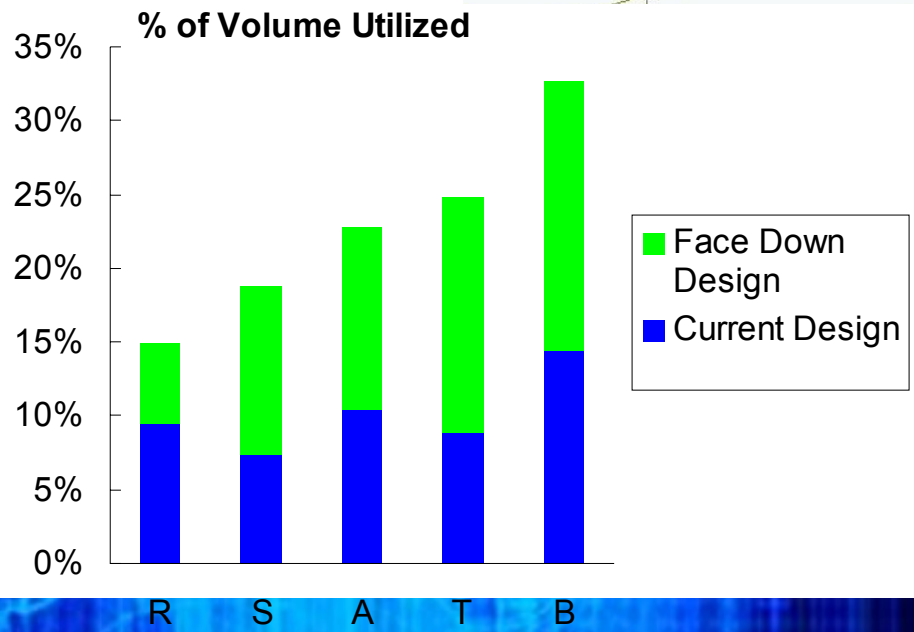
Standard Construction



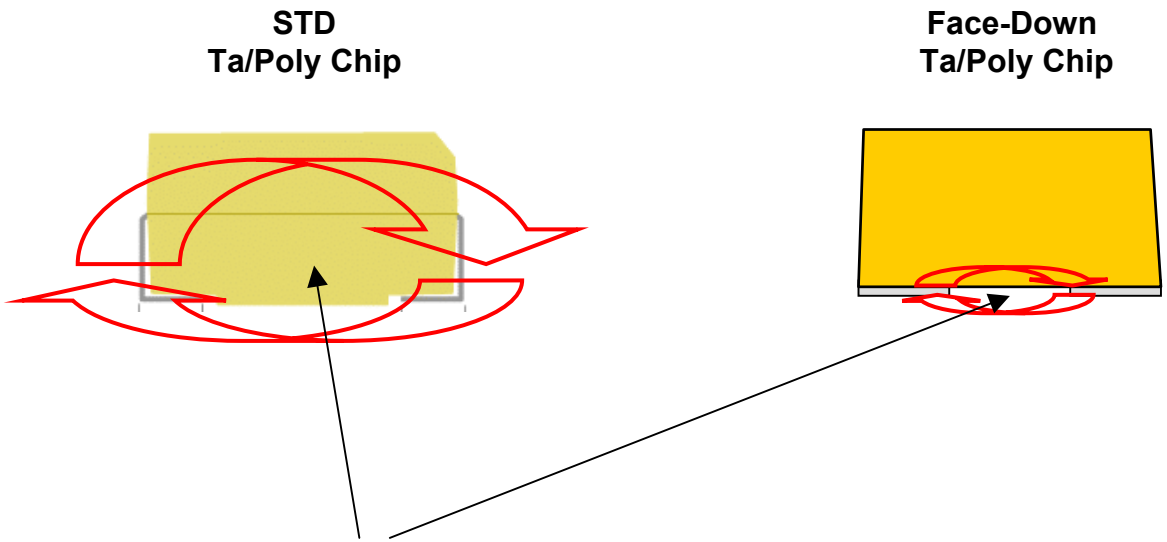
Facedown Termination



Increased Volumetric Efficiency



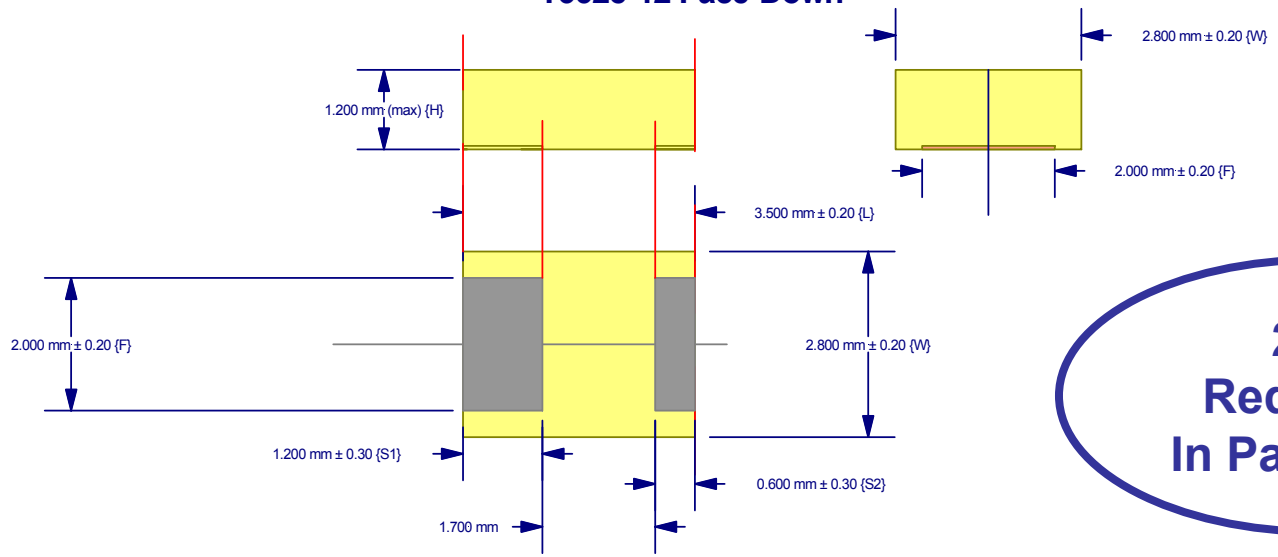
Reduced ESL Loop Areas



Reduction in “loop area” is proportional to a reduction in ESL.

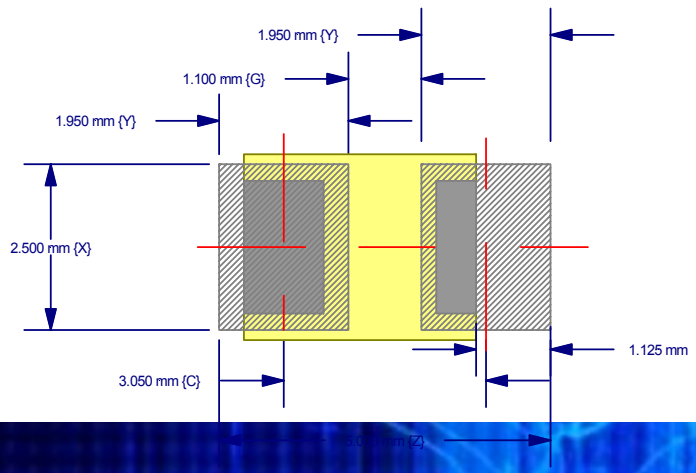
Solder Pad Layouts: T-Case

T3528-12 Face-Down

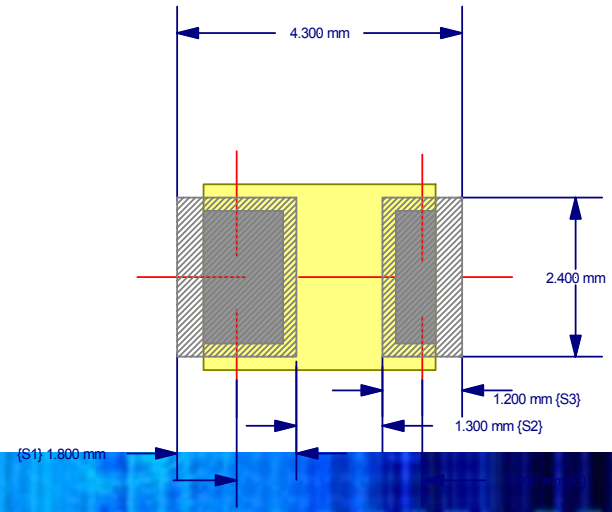


20% Reduction In Pad Space

Using Standard 3528 Solder Pads



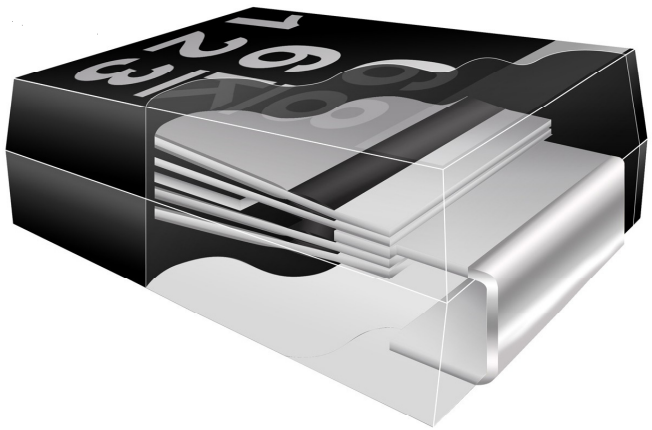
Using 3528/FD Solder Pads



Product offering (July 05)

Style	Cases	Capacitance	Voltage
T520	A (3216-18)	686 – 226	2.5 – 6
	B (3528-21)	227 – 336	2.5 – 10
	C (6032-28)	337 – 157	2.5 – 6
	D (7343-31)	687 – 156	2.5 – 25
	V (7343-20)	477 – 226	2 – 25
	W (7343-15)	157 – 336	6 – 16
	X (7343-43)	108 – 337	2.5 – 10
	Y (7343-40)	108 – 337	2.5 – 10

Aluminum Polymer



- Solid state polymer cathode system – similar to Ta-Poly
- Low ESR, small capacitance roll-off
- Aluminum Anode
- Surface mount