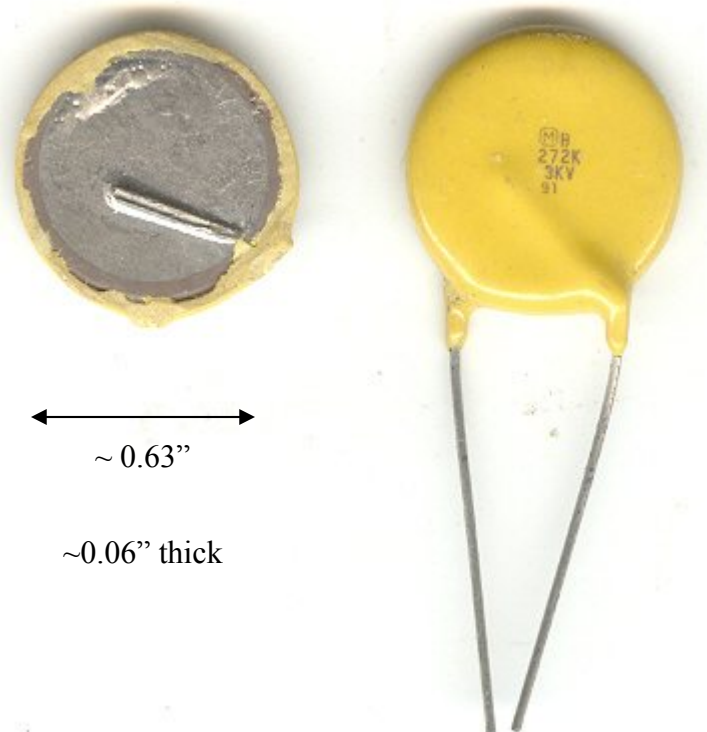


## 1st Ferroelectric Test Sample

I am in the initial stage for preparing the ferroelectric sample:



\* I have an abundance of used Panasonic 2.7 nF 3KV ceramic disk capacitors; the left sample is an example of peeling off the epoxy coating. I am still thinking about how I plan to modify one of the electrodes as the electron emitter and mount it in the vacuum chamber.

\* Because of my interest in having a general purpose experimental electron gun assembly and the ferroelectric type seems to be the simplest type; I decided to review my notes plus further Web search of this ferroelectric cathode. Based on what references I have been able to obtain for FREE on the Web it seems that the low electron emission type operation is based exclusively by repelling surface electrons when the dielectric dipole moment switches so that the negative pole lands very near the surface containing electrons. However the high electron emission mode occurs due to the formation of surface plasma. Apparently the electron emissive surface has striped or grid strips allowing bare alternating dielectric surfaces and conductive strips. Because of the high dielectric nature and when the poles switch near the surface very large electric fields are induced especially at the edges of the metallic strips. The references don't seem to describe exactly what the electron multiplication mechanism is or exactly what material the ions consist of. The references seem to indicate that the above mentioned low level electron emission provides the seed electrons for the plasma. Ferroelectric electron guns are configured such that the ions are filtered so that only electrons are emitted.

\* Vacuum wise I am very good shape; the references describe ferroelectric HPM devices operating in the  $1 \text{ E-4}$  to  $1 \text{ E-5}$  torr. I am able to get down to  $\sim 3 \text{ E-6}$  torr .

\* To my knowledge electron beam HPM devices provide the greatest energy and peak.