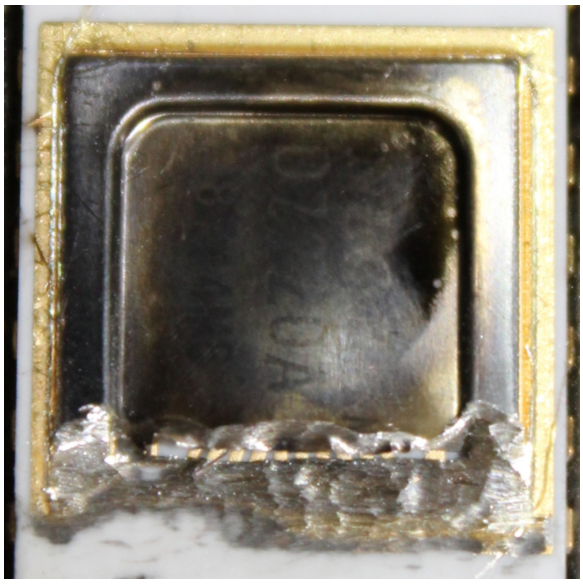
Decapsulation of Ceramic DIP Package

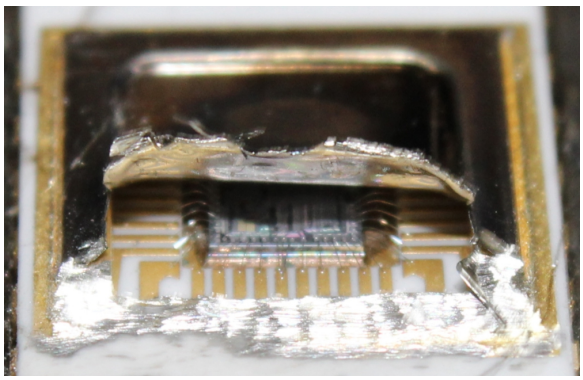
μPD7220A (manufactured in 1987 44th week) Encapsulated in Ceramic DIP Package before Decapsulation
(μPD7220A was still under mass production even after I designed and resigned from NEC in August, 1987)

Decapsulation Trial by Torch Failed

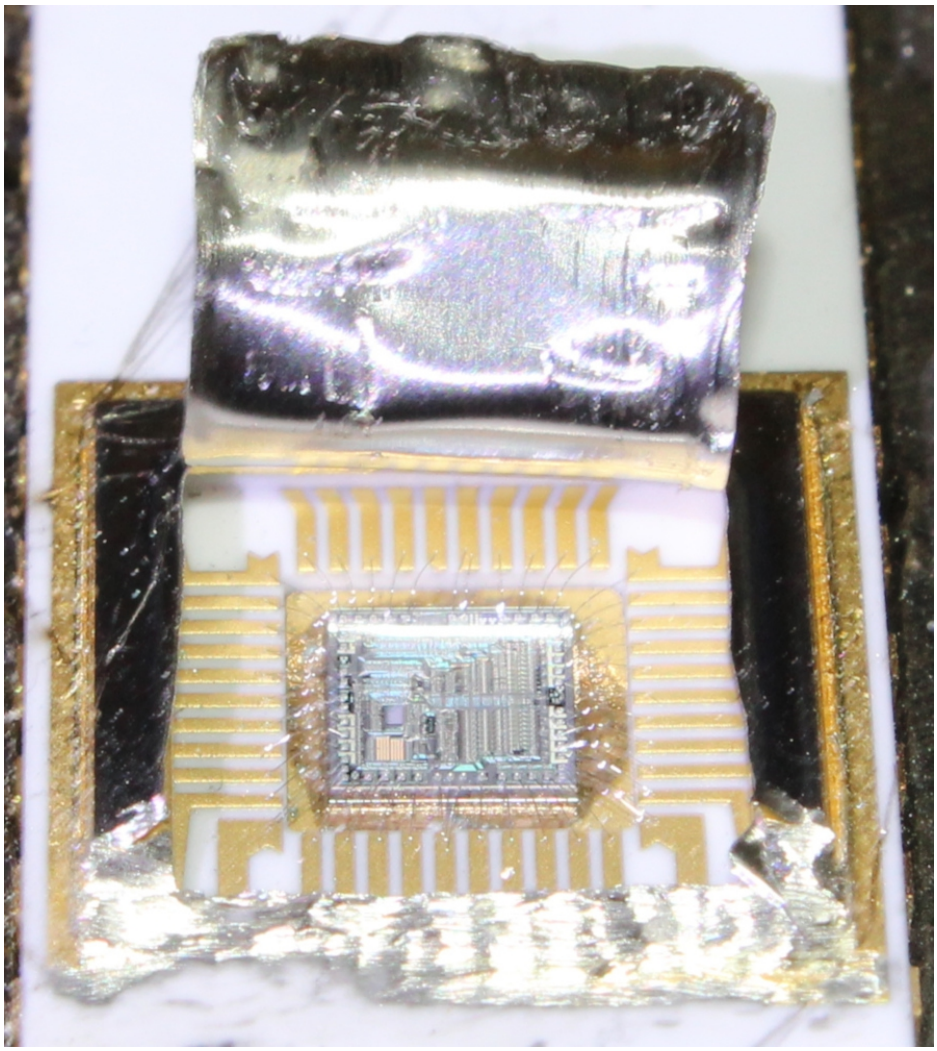
Decapsulation by Rotary Tool & Flat Head Precision Screw Driver Succeeded



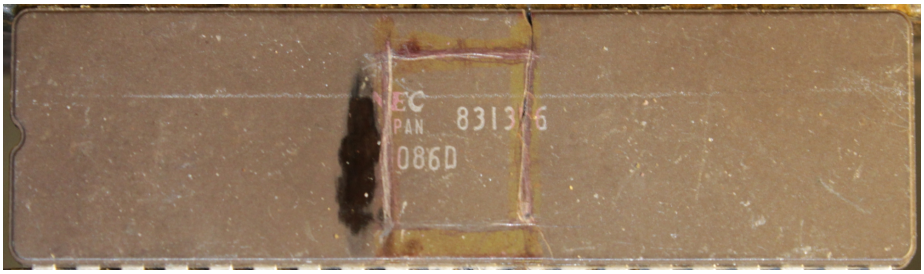
Slit Made by Rotary Tool
(Scorched Cap Due to Torch Trial Failed)

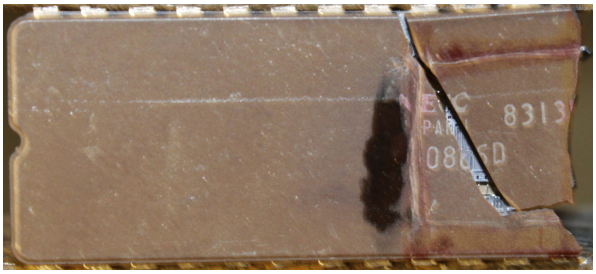


Broaden Slit by Flat Head Screw Driver



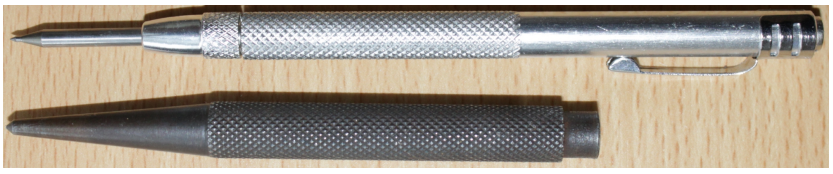
Succeeded (Die & Bonding Wires are all Intact)





Made Scribe on Four Sides, then Hit Center Punch at Lower Right Corner (Was not exact corner...)

Because center punch position was made at a bit upper of lower right corner, right side got cracked properly but other sides were not. But, the partially failed decapsulation did not affect taking die photos. I was lucky.



Old-fashioned Center Punch & Tangsten Carbide Scriber (Left), New Generation Auto Center Punch (Right)

Old-fashioned center punch needs hummer to hit and loses accuracy but in-spring auto center punch is accurate.

Die Photo

Magnification	Images	Resolution (Pixels)	File Size	Resolution* (Pixels)	File Size
20x	60 (6 x 10)	22888 x 23312 (534 MP)	109.7 MB	15709 x 16000 (251 MP)	60.4 MB

* : After reduction due to PDF file limitation.

Tools Utilized

(A) 18 MP (Mega Pixels) DSLR (Digital Single-Lens Reflex; TTL (Through The Lens)) camera (Image size : 5184 (W) x 3456 (H), 3:2) with mini HDMI interface and remote shutter release transceiver
(B) HDMI monitor TV (FHD (Full High Definition) 1920 x 1080)
(C) Metallurgical microscope (Object lens used; 5x, 10x) and camera adapter (Ocular lens; 2x)
(D) Hugin "Panorama photo stitcher"
(E) Gimp "GNU Image Manipulation Program"
(F) Intel i7 3.6 GHz Windows 10 Pro PC system with M.2 (PCIE 4 channels) SSD (Solid State Drive (Flash memory)) and 16 GB DDR4 (Double Data Rate fourth generation) 2400 (MT/s (Megatransfers per second)) synchronous DRAM

Final stage of Hugin stitch processing for making the 20x die micrograph took one hour and 10 minutes.

In details, Refer to "Making Die Photo by Hugin"