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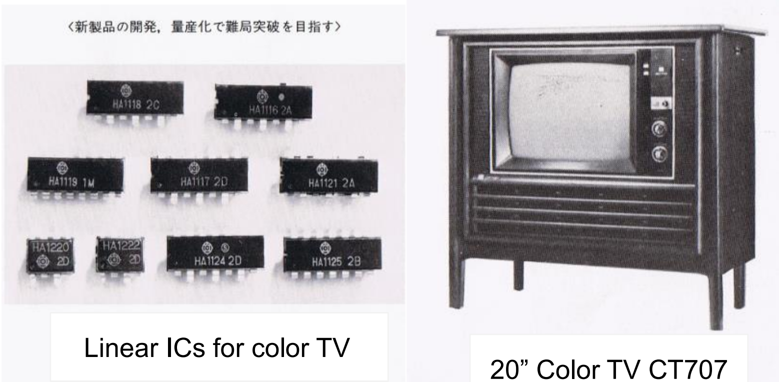
1970
Evolution of resin-mold DIL packages

~ Packaging ~

Around 1970, Musashi Works of Hitachi developed and manufactured plastic mold pin insertion type dual-in-line packages (DILP: Dual In-line Plastic), which allowed larger pin counts at lower cost. 8-pin to 16-pin types were manufactured and applied to linear ICs for color TV and so on.
The lead frames were formed by etching Kovar (Fe-Ni-Co alloy) or copper alloy (phosphor bronze etc.) plates of 10mil(0.254mm) thick which was dipped in ferric chloride solution after resist exposure. The entire lead frame surface was silver plated, and assembly and transfer mold were done.
Following molding, 90-degree lead frame bend forming was done, and the leads were coated by solder dip. The silver plating of entire surface was later replaced by partial plating of Au on the limited areas for chip joint, which was further changed to partial Ag plating. Hence the DILP manufacturing process was established, and pin counts were expanded to 28→36→40→42→64-pins. Progressively feeding mold method was developed for the lead frame pattern formation in order to improve productivity.
For the audio linear ICs, DILP with high heat dissipation shape was designed. For the transfer mold resin, epoxy resin developed for resin molded Si transistor was also used.



Linear ICs for color TV

20” Color TV CT707

Version 2019/1/31